THE INDEPENDENT JOURNAL OF THE LARGE FORMAT MOTION PICTURE INDUSTRY

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GSCA Coverage, cont'd

*Our coverage of the **Giant Screen Cinema Association**'s conference and trade show in Toronto in September concludes with this report on several of the professional development sessions.*

Marketing, Merlot, and Martinis

Rich Swietek, of **Friendly Giant Marketing**, moderated the session that had previously been held early in the morning under the title of "Wake up to Great Marketing Ideas."

Mark Bretherton, CEO of **Worlds Biggest Screen Pty. Ltd**, which operates the **IMAX Theatre Darling Harbour**, in Sydney, Australia, described how the marketing environment for his standalone commercial theater has changed since he became CEO in 2002. Ten years ago, most people got their information about films and showtimes from the paid movie listings in newspapers. The theater paid a lot of money for a small ad, "but that was the way people went to the movies. Every

*(see **GSCA** on page 6)*

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Moody Gardens Installs First GS Laser System

In November, **Moody Gardens** in Galveston, TX, became the world's first giant-screen theater — and the second theater of any kind — with a permanent laser-illuminated projection system. The **MG3D Theater** exchanged its existing **Barco** 4K projectors, installed in 2011, for a **Christie** Duo 6P (six-primary) 4K system with **Dolby** 3D and a new 1.4-gain matte white screen from **Strong/MDI Inc.** The new screen, at 60x80 feet (18x21 meters), is the same size as the silver screen it replaced. A Christie 4K server has replaced the previous **Qube** server, but the existing Barco Auro 11.1 sound system, installed in 2012, was left in place. The system was integrated and installed by **D3D Cinema**, based in Evanston, IL, with significant technical assistance from Christie.

The laser modules — six for each projector — are housed in a separate rack, and their light is transmitted to the projectors through optical fibers. Running at only 60% of full power, they are providing reflectance levels of 10 foot-Lamberts for 3D and 17 fL for 2D. (When turned up to full power during the installation process, the result was 18 fL for 3D!) Operating at less than full power will extend the modules' life and allow room to increase power as light output drops due to aging.

According to theater manager **Brandon Compton**, the theater was closed from Nov. 1 to Nov. 14. The first six days were used to fully clean the theater, including the walls and floor. The installation of the laser system took only four and a half days, and the last two and a half days were used for training of Moody staff and, since it was Christie's first laser installation in

*(see **MOODY** on page 11)*

Domes: Past, Present, Future, Part 2

by Martin Howe

This is the second part of a three-part article about the future of digital domes, particularly for the giant-screen market, where digital projection systems are slowly creeping up on, and are about to devour, film systems. The first part described the past and how we got here: approaching the end of 2014 with one or two digital installations using a brace of projectors to deliver the brightness and resolution required to stand confidently alongside film.

Part 1 left us wondering, though. If we just wait a little for an 8K projector to come along, then we can simply install one at the back of the theater to deliver around 8K pixels across and 4K pixels stretched slightly front to back, to cover enough of the screen. One projector, a special fisheye-ish lens, and one big server with built-in encryption. There, that would do it.

So, wait

That's probably the best decision. Just wait. Lowest risk, best possible outcome. By waiting, the technology will get better and cheaper. That's the way it works, right? But how long *should* we wait and how long *can* we wait. A year? Two? Five? Well, how long we *can* wait will depend upon a few things; supplier contracts, the availability of film stock, and the supply of films available on film (rather than digital-only). And the market. If others are going

*(see **HOWE** on page 14)*

Premiering This Month
The Hobbit: Battle of the Five Armies
See page 15.

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Film Producers: Don't Forget the Domes

by Berend Reijnhoudt

Omniversum in the Hague, Netherlands

At **Omniversum**, as an IMAX Dome theater, we review almost all films that are released. Unfortunately, we see ourselves turning down more and more films because we feel that the technical quality is too poor to put on our dome. Our industry and our theater have always been proud of the fact that we have the best film system in the world, and even today I hear that film is still better than digital, or could be better than digital. I am convinced we still have the best projection system in the world, but it's worth nothing if you don't have the content to show how good it is. And to be honest, nowadays I often feel ashamed for what we put up on the screen.

It's painful to reject a film that has a great story and a marketable subject, but looks horrible on the dome, but the worst are those films that look great except for those five minutes that make it impossible for me to show without getting complaints.

This makes me wonder how the economics work for a producer. What would the investment be to make those five minutes look better, and what would the returns be if the film got played on more dome screens? I could imagine that some producers think, "Well, those dome theaters don't have much to choose from, so they will take my film anyway. They have no choice." But even when a producer will not get more releases, I am sure they will get longer or better runs and thus a bigger return in an industry that depends so heavily on word of mouth.

I also believe we should not underestimate the macro effect of better films for domes. We see theaters losing attendance, shutting down, and converting early (perhaps too early) to digital. For the industry as a whole it is important to keep theaters open and successful, but theaters can survive only if they have films that give the audience the WOW effect – films that really make them feel they are not in the theater anymore. They should not be able to escape from the world we put them in, and believe me, when a bad shot comes up, they notice, and they are ripped out of the illusion. They may not tell every time, and they might even have enjoyed the experience, but they will not leave the theater with the feeling that they have experienced something that blew their mind, and then rave about it to others.

So I am asking producers to think about this. Make the calculations, and if it makes no financial sense to invest the extra money and effort, I would like to know as soon as possible, so I don't have to wait for our unique selling point of unparalleled quality to come back, and I can make the decision to convert our theater to digital now for the few more years we will have left. Because if we cannot offer something extraordinary, our industry will not survive.

Berend Reijnhoudt is commercial director of Omniversum, a 79-foot (23-meter) IMAX Dome theater built in 1984. This article first appeared as a blog entry on the Web site of the Giant Screen Cinema Association and is reprinted by permission.

Corrections

In the report on the GSCA's Digital Dome Demo in Richmond in the Oct.-Nov. issue, we reported that "with edge blending, the 8 million total pixels of the five projectors [in the Evans & Sutherland Digistar 5 fulldome system] actually display about 6 million unique pixels." This should have read, "With edge blending, the 8 million total pixels of each of the five projectors actually display about 6 million unique pixels, for a total of 30 million unique pixels on the dome."

In the same issue, an item in the Biz section incorrectly stated that the California Science Center is a client of Event Network. The museum operates its own gift stores and has never contracted with Event Network to run any of its permanent stores. On one occasion a traveling exhibition contracted with Event Network to run its shop while booked at CSC.

Imax Sends Cameras to the International Space Station

On Sept. 21, **Space Exploration Technologies Corporation** (SpaceX) launched an unmanned Dragon cargo ship from Cape Canaveral, FL, to send supplies to the International Space Station. Included on the manifest were several digital cameras that will be used to shoot **Imax Corporation**'s next space film.

The film, which Imax has only identified as ***Untitled Toni Myers Space Documentary*** to date, is called ***A Perfect Planet*** on a NASA Web page describing the project. Directed by **Toni Myers**, it is expected to be released in 2016.

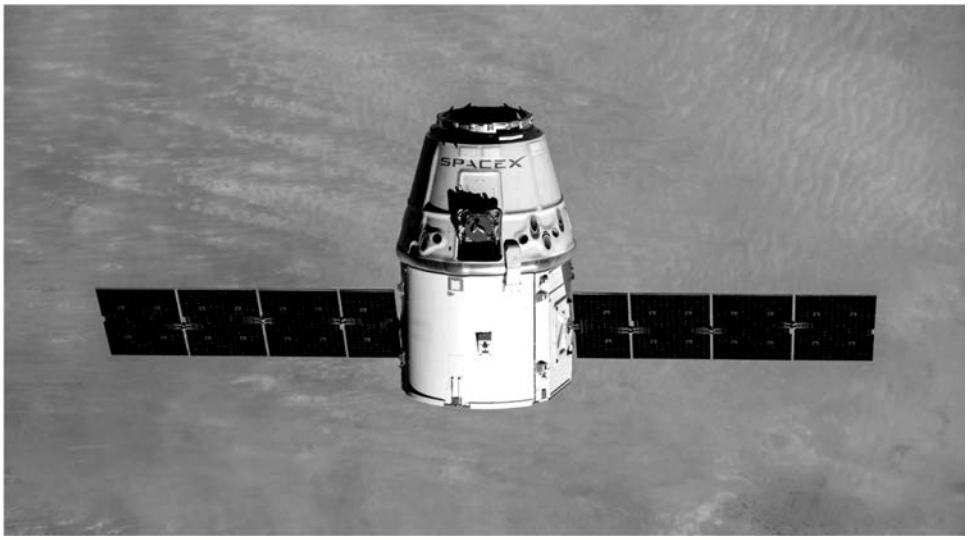
The cameras include **Canon**'s EOS C500 EF 4K digital cinema camera and the 1D-C digital SLR, along with Canon prime and zoom lenses. A **Codex** recorder will capture the cinema footage, recording it onto solid state drives that are returned to earth on Space Shuttle or cargo flights. The camera simultaneously records HD proxies of the footage, which can be transmitted to earth for evaluation before the physical drives with the full-res data arrive.

Veteran cinematographer **James Neihouse** has trained a new crop of astronauts on the digital cameras, as he has for all six IMAX space films, starting with ***The Dream Is Alive*** in 1985. For previous missions, the astronauts had to learn how to thread and handle the bulky IMAX 15/70 film cameras. He tells **Smashbox Studios** that "with digital you get immediate feedback as to what you're recording, so it made the training process a bit easier." The digital cameras are substantially smaller and lighter: about 5 pounds (2.5 kilograms).

Neihouse explains that "Once [the drives] make their way back down to the Johnson Space Center they are then put on a server that we can access. It's a fairly easy process, considering that when we shot film we had to wait for them to come back on the Shuttle, then get processed, and then printed."

Neihouse also used Canon C500s to shoot the launch of the Falcon 9 rocket that boosted the Dragon into space. The capsule arrived at the ISS two days later, and the first drives were returned to earth in late October. Astronauts will shoot footage for the film for about a year.

Photo by Marsha Ivins.



Left: photo by Marsha Ivins. Right: NASA.

Clockwise from top: Canon's Tim Smith, James Neihouse, and Joe Neihouse prepare to film the Falcon launch with a Canon C500 4K camera. The Dragon cargo capsule approaches the ISS. Neihouse (crouching) and crew prepare the remote unmanned camera with the Falcon 9 booster in the background

Dolby launches IMAX competitor

Dolby Laboratories has partnered with **Christie Digital Systems USA, Inc.**, to create proprietary Dolby Vision projection systems featuring laser projectors and image enhancement technology to be part of Dolby Cinema, a "branded premium cinema offering" that will compete directly with **Imax Corporation** in the premium large format market space it has created in multiplexes over the past six years.

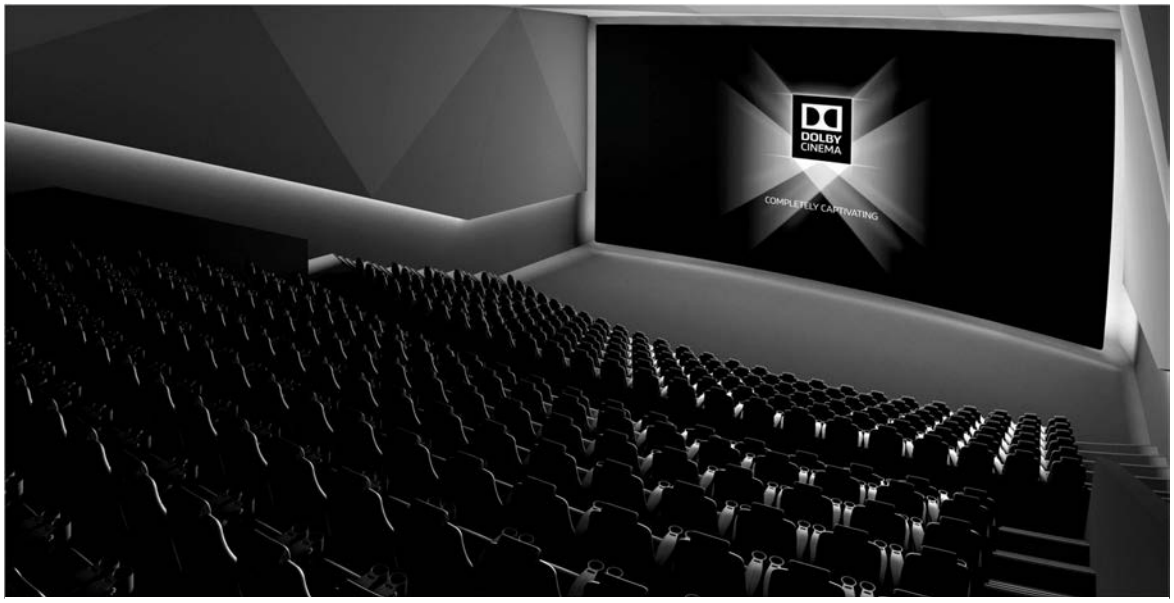
Dolby Vision, which will be available in 2015, consists of image enhancement techniques to expand contrast ratios for high dynamic range (HDR), and a wider color gamut, with high frame rate (HFR) capabilities. The system will include special processing in production and post-production, and will use two Christie 4K six-primary laser-illuminated projectors that are said to be capable of light levels up to 14 fL in 3D and 31 fL in 2D.

Dolby Cinema is a set of theater design elements, including a dynamic, programmable audio-visual entranceway; a large, wall-to-wall, floating screen with halo lighting; premium seating; and the Dolby Atmos sound system.

According to *The Hollywood Reporter*, Dolby previewed the system to "leading directors, cinematographers, and studio executives" earlier this year in Los Angeles. The article reported that Oscar-winning cinematographer **Emmanuel Lubezki** (*Gravity*) "has said he's eager to make use of HDR," adding that Hollywood tech experts "believe consumers will see a noticeable difference with HDR," compared with 4K and HFR.

The first Dolby Cinema installation with Dolby Vision will be in a new **JT Bioscopen** multiplex in Eindhoven, Netherlands, early next year, with other European locations to follow. Dolby is reportedly offering exhibitors a joint-venture deal, similar to the one Imax offers, under which it contributes the projection systems, the exhibitor pays for the theater conversion, and both split the revenues. The company is also in discussions with studios to ensure that films are being shot with Dolby Vision in mind. *Hollywood Reporter* suggests that **Disney** is a "likely... early candidate," with the next ***Star Wars*** episode due in December 2015.

Dolby has a market capitalization of $4.61 billion and fiscal 2014 revenues of $960 million, compared to Imax's $2.1 billion market cap and $293 million in 2014 revenues.



Dolby Cinema theaters will feature wall-to-wall floating screens with halo lighting and Atmos sound systems.

Dolby Laboratories

Smithsonian issues media RFP

Smithsonian Enterprises, the commercial arm of the **Smithsonian Institution**, has issued a request for proposal seeking "a company that specializes in the development, packaging, promotion, sale, and exploitation of intellectual property for the development of feature films and IMAX films" to create films based on "Smithsonian intellectual property, collections, exhibitions, research, staff resources, and the themes of art, culture, history, and science." Work on the projects would start by the fall of 2015. The deadline for submissions is Jan. 9, 2015.

For more information, visit tinyurl.com/SErfp.

Imax theater, film deals

Imax Corporation has made theater deals in Japan and China and announced new film deals in China.

In Japan, the company has signed an agreement with **Toho Cinemas, Ltd.**, to build an IMAX theater in a new retail center that Toho's parent company is building in the Shinjuku section of Tokyo. The deal is Imax's first with Toho, and the installation will be the first IMAX theater in downtown Tokyo. Toho operates 54 theaters with 596 screens throughout Japan.

In China, **Beijing Bona International Cineplex** agreed to open three new IMAX theaters, bringing its total commitment to four. The new theaters will be located in Wuhan, Beijing, and Taiyuan. The chain's first IMAX screen opened in Tianjin in 2012. Bona operates 22 theaters and is involved in film production and distribution, and talent representation.

THE BIZ

NEWS

Imax has also announced deals to release three films in China. On Dec. 2, the first part of **John Woo**'s ***The Crossing*** will open on IMAX screens in China. The second part opens in May 2015. According to a press release, "the film takes place during the Chinese Revolution in the late 1940s, when many couples fled China, crossing the Taiwan Strait to Taiwan."

On Feb. 9, 2015, **Daniel Lee**'s ***Dragon Blade***, starring **Jackie Chan**, **John Cusack**, and **Adrian Brody**, will open in Chinese theaters. "Set in 48 BCE, *Dragon Blade* tells [a] thrilling story of heroism, friendship, and betrayal which has never before been depicted on film," according to a release.

D3D launches Cinefolio package

D3D Cinema has announced that it will offer **Cinefolio**, a "turnkey digital cinema initiative" for small and medium-sized museums, science centers, and other institutions for which a giant screen theater is not an option. Cinefolio provides a "bundled hardware and content portfolio to institutions for no upfront cost," according to a press release.

Three models, scaled to the space available, can be installed in auditoriums, classrooms, exhibit halls, and other spaces. In addition to "reliable and user-friendly digital cinema equipment," Cinefolio includes 30 titles from **BBC Earth**, **Giant Screen Films**, **K2 Communications**, **National Geographic**, and **SK Films**.

December, BioPixel deal

December Media, producers of ***Hidden Universe 3D***, have signed an agreement with **BioPixel** to develop and produce three giant-screen films, starting with ***Great Barrier Reef 3D***, which will start shooting in March 2015. No details were released on the other two projects, which will begin the scripting process in spring 2015. December is currently working on two other projects, ***Life in Space 3D*** and ***Earth Story 3D*** with **Swinburne University** in Melbourne, Australia.

December is based in Victoria, Australia, and BioPixel is based in Queensland.

Deluxe to master in CGS format

At **ShowEast** in October, **Deluxe Laboratories** announced that it will provide mastering services for the **China Giant Screen Format** introduced by the **China Film Co.** As part of the deal between the two companies, Deluxe will build a mastering facility and screening room in Los Angeles. According to a press release, CGS is "a premium large-format cinema system based on proprietary technology."

As we reported previously (*see The Biz, February 2014*), **Imax Corporation** sued **GDC Technology** and former employee **Gary Tsui**, alleging he stole trade secrets that allowed GDC to develop the China Giant Screen format, which is now being used in over 50 theaters in China.

Amazon Adventure gets $1M

The **Pacific Science Center** has received a $1 million grant from the **Gordon and Betty Moore Foundation** in support of ***Amazon Adventure***, a giant-screen film being developed by **SK Films** and **Tangled Bank Studios**, the film and television production unit of the non-profit **Howard Hughes Medical Institute**. The foundation was established by the co-founder of **Intel Corporation** and his wife to support "bold ideas that create enduring impact in the areas of environmental conservation, patient care and science."

Earlier this year, the project received a grant of $2.7 million from the U.S. **National Science Foundation** to support production costs, create the educational package, and study giant-screen learning outcomes.

Amazon Adventure tells the adventure story of **Henry Bates**' 11-year journey through the Amazon in the 19th century, his discovery of "Batesian" mimicry in animals, and other contributions to science. Production is expected to begin in 2015 for a release in 2016.

PERSONNEL

Brian Davis heads Norwalk

The **Maritime Aquarium** in Norwalk, CT, has selected **Brian Davis** to be its new president, replacing **Jennifer Herring**, who has served in that role for ten years. Davis comes to the aquarium from the **Georgia Aquarium** in Atlanta, where he was vice president of education and training.

Brian Davis

Davis has a Ph.D. and a master's degree in secondary science education from Georgia State University, and a B.S. in environmental science from Rutgers University. Before the Georgia Aquarium, he worked at the New York Aquarium, at Zoo Atlanta, and in the Georgia school system.

McLennan honored by IMERSA

Planetarium veteran **Ian McLennan** will receive an award for lifetime achievement at the **IMERSA Summit** in Denver in February. The association of Immersive Media, Education, Research, Science, and Art will honor McLennan's "work in museums and planetariums [over] some five decades, from opening Edmonton's Queen Elizabeth Planetarium in 1960 to creating concepts for world-class science centers...for Tucson and Houston," according to a press release.

Ian McLennan

McLennan is principal of **Ian McLennan Consulting**, based in Vancouver, BC, Canada.

The IMERSA Summit will be held from Feb. 25 to March 1, 2015, at the **Denver Museum of Nature and Science**. For more information, visit imersa.org.

GSCA's Conference in Toronto

Mark Bretherton from Sydney's IMAX Darling Harbour

*(from **GSCA** on page 1)*

cinema in town was on a couple of pages."

Now people go online. About five years ago, to determine whether newspaper ads were still worth the expense, his theater asked customers how they knew about the show for which they had just bought tickets. Twenty percent said from a newspaper ad. Sixteen percent said they hadn't been thinking about IMAX, but came because of a newspaper listing. This convinced him that newspaper listings still had value.

That's not to say that the theater doesn't use online and social media. Its database of 65,000 people receives regular e-mails, and Bretherton's marketing staff used a Facebook campaign to add new members. Called the "Director's Chair," it offered 20 sets of two passes to every film the theater showed in a year. Participants were asked to list Facebook friends they'd bring if they won, providing a source of new members. Of the 12,000 unique entries, over 7,000 were new subscribers, increasing the database by more than 10%.

At the **Museum of Science** in Boston, **Corinna Graham** is a marketing analyst and manages the museum's Facebook, Twitter, and Instagram accounts. To promote **National Geographic**'s ***Pandas: The Journey Home*** in the **Mugar Omni Theater**, they "wanted to try to do something different and distinctive with this, in addition to our usual multi-channel campaign." Two staff members, the controller, and director of IT ("people with high pressure jobs were drawn to this assignment," Graham explained), dressed up in a panda suit and went to two popular Boston locations: Chinatown and Fenway Park, Boston's baseball stadium.

The museum sent out tweets offering four free movie passes to anyone who tweeted pictures of the panda using the hashtag, *#findthepanda*. Graham said that the response was "so much fun, and amazing to see. We had whole companies go out to find the panda, take a little break from work."

The result was 56,000 tweets and retweets, and a fill rate for screenings of the film of 40% in the opening months, up from the average of 31%.

Kim Cavendish, chair of the GSCA and CEO of the **Museum of Discovery and Science** in Ft. Lauderdale, FL, since 2002, explained how her museum promoted its launch of **MacGillivray Freeman Films'** ***Journey to the South Pacific***. MODS coordinated the film opening with the local annual Polynesian Cultural Festival, which highlights the music, dance, and culture of Hawaii, Samoa, Tahiti, and New Zealand. In addition to simply selling tickets, the goal was to "enhance the visitor experience, and to take it beyond the film itself, and make it part of the entire museum and part of the whole community." The plan also "gain[ed] friends through creating community partnerships that would have lasting value."

The event included demonstrations of surfing, paddleboarding, lei making, and other arts and crafts. There were dancing girls, a fire knife champion, free sushi from a local restaurant, all provided at no cost to the museum. For its part, the museum had staffers talk about the coral reefs and do science demos. Visitors were asked to make paintings of coral reefs, and the best ones were put on display in the museum store, updating its appearance for free.

The museum paid for weekly ads in the local newspaper, radio spots, and internal and external signage. It also offered cross promotions and ticket giveaways with other local attractions. An educator preview featured a discussion with producer **Shaun MacGillivray** via Skype, and helped raise school bookings up to previous levels following a 13% decline in the previous year.

Jackie Mollet of the **Saint Louis Science Center** described the launch of ***D-Day: Normandy 1944*** that she recounted in an article published here in the September 2014 issue.

GS 101: Filmmakers' Session

Corinna Graham of the Museum of Science, Boston

GS 101, Filmmakers' Session (l to r): David Douglas, Toni Myers, Brian Eimer, Myles Connolly.

For several years, the GSCA has offered a session for newcomers to the business entitled "Giant Screen 101." This year, that session was split into two, with one oriented to theater operators and the other to filmmakers. **Daniel Ferguson**, director of ***Jerusalem***, and **Christian Fry**, director of ***Air Racers***, moderated the latter session.

Myles Connolly of **360-Media** spoke about picture editing; **Toni Myers** of **Imax Corporation** discussed writing to GS film; **David Douglas** spoke about cinematography; and **Brian Eimer** of **Images in Sound** talked about sound.

Connolly said his presentation was titled "How to cut great movies, make everyone happy, and get rich while doing it," adding, "but none of that will ever happen." He said that the editorial process has to begin before shooting, and that the "fix it in post" attitude can "doom [films] to, at the very least, difficulty, and sometimes failure. This isn't traditional cinema; it's not just television editing blown up to the giant screen. It's very customized for the giant screen." He said that although 6K digital cameras are now becoming available, "Film is still the very, very best quality capture mechanism. There's a really high bar that you have to live up to, and audiences expect that."

Connolly said that although there are many editing systems available — Avid, Final Cut Pro, Adobe Premiere — "every system has pros and cons, there's no perfect fit." The formats in which the film is released will also have a role in shaping the post process. "Understanding clearly what you'll need at the end is going to help you make decisions at the beginning."

He cited research that shows that in 2000, the average person's attention span was 12 seconds, and in 2013 it was eight seconds. "A goldfish's attention span is nine seconds!" To counter the quick cutting style common in movies, commercials, and videos, GS films have to "offer something real. We give [audiences] true, believable astounding stories and images. The sheer size and beauty of the giant screen image requires more time for audiences to absorb it."

Myers explained that in making space films she relies on the astronauts to shoot when they aren't performing other required duties. This means she doesn't always know what shots she's going to get. "So you have to be flexible in the shaping of your film, and the writing is something that comes along organically as your working. The writing feeds into the score, feeds into the sound effects. It's like baking bread."

She recalled that in 1968 she was in England, working for **John Lennon** and **Yoko Ono**, and made a short film illustrating their song, "The Ballad of John and Yoko," (a form that would later be called a music video). "I didn't have to go out and shoot anything. Everything had already been covered by news agencies. For every line in the song there was a shot in a local stock footage news library. That is one style of writing. Fortunately, I was liberated from having to do any, and that got me in the habit of resisting [writing] to the very end."

Soon after, she returned to Canada where she edited **Graeme Ferguson**'s first IMAX film, ***North of Superior***. Ferguson found a prolific songwriter (**Zal Yonovsky**), and told Myers to use one of his songs for the film. "So I picked a song that did all the writing for me. It literally described everything we were seeing in the film." Over the next decade, working on feature films and TV shows, she learned a few lessons: "Structure is everything. Less is more, when it comes to narration. And there are no rules."

For 1985's ***The Dream is Alive***, a linear storyline that followed a mission chronologically "[wasn't] a very compelling structure, believe it or not. So we came up with a different structure. And that's why I call that writing. It's just as important as the words you fit to it." Similarly, for the narrator, Ferguson made "the choice of the century in choosing Walter Cronkite, who was *the* voice of space."

For ***Deep Sea 3D*** in 2004, Myers was offered the opportunity to have **Kate Winslett** and **Johnny Depp** as co-narrators, although the original script had been written for a single narrator. Although splitting it into parts was not difficult, Myers was unable to record the stars together at the same time. "I thought it was partly successful, but I admit it was difficult having the separate performances and trying to calibrate one with the other."

For several of the space films, Myers recorded the astronauts candidly discussing their experiences in space, and used those recordings as narration. Having them read a prepared script would have been deadly — "they're not professional actors" — but no pro could convey the

*(see **GSCA** on page 8)*

David Douglas with a 15/65 camera on a cinebulle.

*(from **GSCA** on page 7)*

emotion of their experiences as effectively. "What you'd miss is the personality of the astronauts and what they're feeling about their own experience."

Douglas discussed developing the prototype IMAX digital camera while shooting ***Born to Be Wild*** and ***Island of Lemurs: Madagascar***. He was skeptical: "I thought the digital camera would crap out in the first couple of weeks in Borneo, just because my experience with electronics...was that that's what they do. But in fact it didn't, and the more we kept it, the more we liked it." When filming wildlife with a film camera, the filmmaker has to become good at "predicting the near future," anticipating what the subject animals will do. The digital camera "changed all of that" because of its RAM buffer, which can store about 90 seconds of material. "The default position for the camera is 'on,'" and when the animal does whatever the filmmaker likes, the camera is stopped and the last minute and a half are saved. The result is better footage and much less tension among the crew.

The digital camera's light weight (and long shooting duration) makes it capable of shooting 3D on platforms that were impractical for the massive Solido film camera. For *Island of Lemurs*, Douglas shot 2D film and 3D digital from a cinebulle, a motorized hot air balloon, to obtain slow, floating shots less than 100 feet (30 meters) off the ground, close enough to provide effective 3D. Even when shooting from conventional aircraft, like helicopters, which Douglas called "shaking machines," digital cameras can use simpler and lighter stabilizing systems and it is easier to fix shaky digital footage in post. "It's expensive to do that, but you're only working on the piece that's in the movie." The digital camera also shoots at higher frame rates than are possible with film, 120 fps and higher, allowing slow motion shots.

Sound designer Eimer started by asking "What makes sound design for the giant screen different from any other format?" The immersiveness of the visual experience "allows you to put your audience in the middle of the action." Eimer uses a number of techniques to accomplish this, "creating an organic space that the audience is sitting in the middle of." The size of the giant screen means that "the image does not hide anything." Unlike smaller formats, where, say, a dog in the lower left corner of the frame might not be noticed, in GS films, the audience can see every detail in the picture, and the sound track has to reflect anything visible that should be creating a sound. Movement of elements in the sound track, and full use of the dynamic range capabilities of the theater sound systems, also add to the immersiveness of the experience.

Capturing audio while shooting on location is also critical. "If you're going to go to the deepest jungles... around the world, to not record that while you're there, and ask me to reproduce it [in post], just seems a missed opportunity." Compact digital audio recorders, like the Zoom H2n, can record four channels of high-resolution audio, and cost less than $200. After recording ambient sound on location, "all that uniqueness of your location comes back to me, and that's my main building block for the start of your sound track. You create a library of location effects."

Digital Pathway for Domes

Consultant **Paul Fraser** of **Blaze Digital Cinema Works** moderated a session outlining how film-based dome theaters can prepare to convert to digital projection. Eight panelists spoke on three aspects of the issue: technology, theaters, and films.

Technology. Imax Corporation's chief technology officer, **Brian Bonnick**, said that the company has been working for more than five years on a digital solution for domes. The large surface area and low gain (to reduce cross-reflectance) of domes made xenon-powered 2K projectors impractical; only with higher-res systems and laser power can the challenge of GS domes be met. Six-primary laser projectors also allow 3D on the dome with less light loss than the active glasses system Imax had previously used for its Solido 3D dome system.

Bonnick pointed out that digital projection will eliminate the negative aspects of

Brian Bonnick described Imax's laser system.

Warner Bros.

film: "weave and jitter, film flicker, degradation of the print over time, and maintenance of the system. It's like a hot rod: if you continually maintain it, it's great, but if you let if falter, you're at the side of the road. Those issues we don't have any more" with digital. He added that projector resolution alone does not guarantee a sharp image: "you need a high quality lens; that lens needs to be aligned daily, preferably by computer, not the human eye." Higher contrast also helps create an image that appears sharper to the eye. The IMAX laser projector has contrast levels exceeding that of 15/70 film, and provides more brightness than IMAX film projectors. The laser system will put out 60% more light than conventional projectors, 22 fL instead of the standard 14 fL.

Imax's laser dome system will place the two projectors at the back of the theater, not in the "doghouse" in the center of the dome, using custom manufactured lenses. Bonnick suggested that the system will include technology that will stretch or warp the digital image for the specific geometry of the dome in which is installed.

Bonnick said that heat causes the image chips in digital projectors expand and contract, leading to "pixel drift," which makes it virtually impossible to maintain pixel-perfect alignment of two projectors. "You lose resolution. It doesn't matter how many pixels you have if they're drifting." The company's solution is patented, new technology that splits the image into a softer, fuzzier image with most of the color information, and an ultra-sharpened image with most of the detail, and combines them into an image that appears sharp and colorful, but doesn't lose clarity when pixels drift.

The first IMAX laser dome systems will be installed in late 2015.

Ed Lantz of **Vortex Immersion Media** said that his mentor, **Mike Hutton**, had said "film sucks on a dome, that's why we built a flat screen for film and a dome for my planetarium." Among the problems inherent in domes are the seams in the dome surface, and cross-reflectance, which reduces contrast. But since the days of CRT projectors, planetariums systems have been getting better and better, with auto-blending and auto-alignment. He discussed the various projector placement arrangements used by planetariums and GS film theaters, and expressed optimism about 6P laser projection. The ultimate solution, however, would be to do away with projection entirely, and cover the dome with emissive panels that generate light directly.

On the topic of multiple-projector systems, Lantz said that although a single-projector, single-lens system is possible, "there are some inherent limitations of the optics...and the multi-projector approach gets you out of that. It lets you make a crisper image over the entire dome surface." Lantz feels that the current 8K systems are providing acceptable resolution, but hopes that brightness levels will increase.

Theaters. Jackie Mollet of the Saint Louis Science Center said that she is looking for a digital system that will provide an image as good as or better than the film image from her existing IMAX 15/70 projector. The timing of the installation process and upgrading options are critical concerns for her in selecting a new system. She is not particularly interested in 3D, since she feels that the dome is already immersive enough.

John Loos is operations VP for the **Washington Pavilion of Arts and Sciences** in Sioux Falls, SD, which switched from an 8/70 film projector to a DCI-compliant, single projector, 4K system for its 60-foot (18-meter) dome in 2012 (*see Shorts, Summer 2012*). He said that the system has met the majority of his expectations, although he wasn't able to expand the image to the 130-degree vertical spread that his film system previously had, only getting to 110 degrees. The fact that the

*(see **GSCA** on page 10)*

Bonnick showed how the IMAX digital dome system splits pictures into a soft image (1) and an ultra-sharp one (2), blending on screen to make a normal image (3).

Jon Loos, Washington Pavilion, Sioux Falls, SD.

*(from **GSCA** on page 9)*

system is DCI-compliant allows Loos to program a wide variety of alternative content, including Hollywood films, gaming, and live events like rocket launches.

The **Tycho Brahe Planetarium** in Copenhagen, Denmark, started out in 1989 with an IMAX Dome system, later added a digital fulldome system, and finally a DCI-compliant insert system. As Fraser put it, "you effectively multiplexed yourself, making it possible to show many different types of content under one dome." **Steen Bjerre**, a member of the planetarium's board, said that the venue has lost half a million visitors over the last ten years, despite good publicity around the technology upgrades, including a visit by the Danish crown prince. "Technology does not solve the problem." He said that although the theater has enough educational films for the school groups in the mornings, there isn't enough content suitable for children and adults in the afternoons or for adults in the evenings.

Audience surveys indicated that the main reason previous visitors didn't return is that "'you're showing the same films!' The entertainment business has changed dramatically in the past ten years, but the content of the films we show hasn't." Bjerre feels that GS filmmakers, distributors, and theaters don't talk among themselves enough to develop new kinds of programs. He pointed out that many European IMAX theaters have closed and said that his is now "living on the mercy of the bank," and that more closures in Europe could be coming.

Films. Asked about his concerns about digital projection, **Mark Katz** said that **National Geographic** "want[s] our films to be presented in the best possible way, as often as possible, and we know that there are plenty of places where they're presented in a way this isn't perfect or ideal, but we strive for the best possible presentation."

Veteran GS director **Greg MacGillivray** said his concern was that "big theaters move to digital too early." He said that the audience that GS theaters have built over the past 40 years expect "the best quality presentations available anywhere...but I think that digital isn't quite there yet. So I'm prompting people wait and evaluate and don't be the first out of the chute." He's said he's "encouraged" by the wider contrast ratios promised by laser projection, but thinks that it will be "two to three or four years before digital projection...equals 15/70." On the capture side, he feels that it will be six to eight years before digital cameras can match the quality of 15/70 film.

MacGillivray said that a film intended for dome theaters has to be designed with the dome in mind from the start. Moving the camera forward instead of sideways, using fisheye lenses, holding a shot for a long time, and other techniques result in better shots in the dome. MacGillivray's company owns four digital cameras, and he takes them on most shoots, along with the 15/65 film cameras. He likes digital's slow-motion and pre-roll capabilities.

Planetarium provider **Evans & Sutherland** has been converting GS films to fulldome since 2007, and now has about 40 titles in its catalog. E&S' **Michael Daut** said that in the fulldome world, most productions were entirely CGI, and "one of the things we noticed was absent...was the real world." He looked at the available GS films and selected 1994's ***Africa: The Serengeti*** for the appeal of its wild animals and its "evergreen" topic. They created a custom warping algorithm to adapt the 1.33 image to the dome — "that was a bit of a challenge" — and began converting other films, like ***Sea Monsters***. He described the technical aspects of digitally warping a film image to cover most of a circular dome image. Several different warps can be used, based on the nature of the content and the framing that has been used.

Katz pointed out that conversions from GS to fulldome can be reasonably successful, but still involve some compromises. Daut agreed, saying that some films work better than others, but that "if you respect the lower part of the frame, use forward and backward movements," the film will work better on a dome.

The GSCA's next meeting will be the Film Expo and Filmmaker Symposium in Los Angeles in March, followed by the annual Conference and Trade Show in San Francisco in September. For more information, and to register for the Film Expo and Filmmaker Symposium, visit giantscreencinema.com.

Steen Bjerre, Tycho Brahe Planetarium, Copenhagen.

Moody Gardens is First Laser GS Theater

*(from **MOODY** on page 1)*

North America, Christie technicians.

The IMAX film projector previously sat on the optical centerline, and the Barco projectors were positioned to the left of center. In the current upgrade, the booth's projection port was enlarged, and the IMAX projector's rail mounting system was extended to place the machine against the back wall, so that the new Christie projectors can sit on the centerline. (Compton doesn't expect ever to use the IMAX projector again, but is keeping it "just in case." The Christie units can be moved aside and the 15/70 projector put back in place in a matter of hours, although with the new white screen, 3D IMAX is no longer an option. Compton says that removing the IMAX system from the booth would not be worth the trouble and expense.)

The new Christie servers are handling all house and show automation functions, and the projection system can also be remotely controlled by staff members anywhere through their smart phones. However, Compton says he intends to keep a projectionist in the booth for all shows. Although many digital theaters now run shows automatically on a preset schedule, or with a button push by a staffer outside the theater, Compton says, "If there's no one in the booth, the first person to see a problem is an audience member," and he is too committed to quality presentations to let that happen.

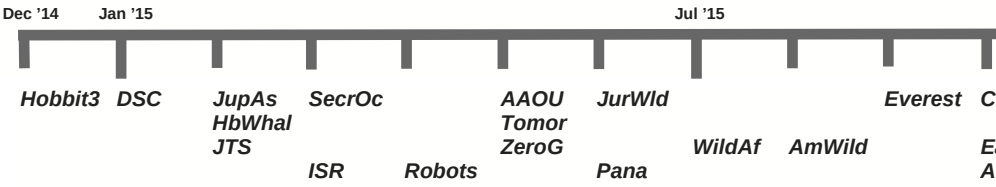
As we reported previously (*see The Biz, May-June 2014*), after receiving bids from several manufacturers, Moody selected the Christie system because it was available earlier than others and at a purchase price 35% below the closest competitor. Other offers required royalty or lease fees. Compton estimates that the system will save up to $500,000 over ten years by eliminating xenon lamp costs, and may also lower the booth's electrical bill slightly.

Moody Gardens is planning to invite the industry to an open technical showcase of the system some time early in 2015; the date will be announced soon.

The world's first permanent laser-illuminated digital projector was a similar Christie system installed in China's **Shanghai Film Art Center** in June. The system in Galveston was the second, and five days later, the **Cinerama Theater** in Seattle, WA, also installed a Christie 6P laser system. Imax Corporation has said it will unveil its first laser system in Toronto this month.

Photo by Art Mercurio, D3D Cinema.

Christie 4K laser projectors being installed n the booth of Moody Gardens MG3D Theater. The racks on the left house the laser modules. Top: the IMAX 15/70 3D GT projector will remain in the booth, and could be brought back into service, but has effectively been retired.



All films are 3D unless noted, underlined titles are 2D
* New listing.
Updated information is printed in **bold**.
Unless noted, all films will run about 40 minutes.
Some titles with limited release territories are not listed.

Deepsea Challenge 3D
Earthship Productions; distributor: National Geographic; directors: John Bruno, Andrew Wight, Ray Quint; producers: Andrew Wight, Brett Popplewell; script: Andrew Wight, John Garvin; DPs: Jules O'Loughlin, John Stokes; score: Ricky Edwards, Brett Aplin, Amy Bastow; executive producers: James Cameron, Lisa Truitt, Maria Wilhelm, Mikael Borglund; narrator/cast: James Cameron. Release: January 2015.

Jupiter Ascending
Village Roadshow; distributor: Warner Bros.; directors: Andy Wachowski, Lana Wachowski. Cast: Channing Tatum, Mila Kunis, Sean Bean, , Douglas Booth, Terry Gilliam. Release: Feb. 6, 2015. DMR.

Humpback Whales (wt)
MacGillivray Freeman Films; distributor: MacGillivray Freeman Films; director: Greg MacGillivray; producer: Shaun MacGillivray; script: Stephen Judson; DPs: Brad Ohlund, Howard Hall, Greg MacGillivray, Ron Goodman; score: Steve Wood. ***Release: Feb. 13, 2015.***

Journey to Space: A Shuttle Adventure (wt)
K2 Films, Giant Screen Films; distributor: K2, Giant Screen Films; writer, director: Mark Krenzien; DP: Sean Phillips. Cast: astronauts Chris Ferguson, Serena Aunon. Release: February 2015.

Secret Ocean 3D (wt)
Ocean Futures Society; distributor: 3D Entertainment Distribution; director: Jean-Michel Cousteau; producers: François Mantello, Jean-Jacques Mantello; DP : Gavin McKinney; script : Pamela Stacey ; score: Christophe Jacquelin. Cast: Jean-Michel Cousteau. Release: March 2015.
– Post production of 15/70 and dome versions under way.

Living in the Age of Airplanes *****
Explores the profound ways that aviation has transformed our lives, connecting countries and cultures while expanding horizons and minds.
Terwilliger Productions; distributor: National Geographic; director: Brian Terwilliger; producers: Bryan Carroll, Brian Terwilliger; DP: Andrew Waruszewski; score: James Horner; executive producer: James Moll. 2D. Narrator: Harrison Ford. Release: April 10, 2015.

In Saturn's Rings
SV2 Studios; distributor: BIG & Digital; director, producer, writer, executive producer: Stephen van Vuuren. 2D. Release: Spring 2015.

Robots
National Geographic; distributor: National Geographic; director: Mike Slee; producers: Jini Durr, Brooke Runette; script: Richard Panek, Mike Slee; DP: Sean Phillips; executive producer: Lisa Truitt. Release: Spring 2015.

Avengers: Age of Ultron
Walt Disney Pictures; distributor: Walt Disney Pictures; director: Brad Bird. Cast: George Clooney, Judy Greer, Britt Robertson, Hugh Laurie, Kathryn Hahn. Release: May 1, 2015. DMR.

Tomorrowland
Walt Disney Pictures; distributor: Walt Disney Pictures; director: Joss Whedon. Cast: Aaron Taylor-Johnson, Elizabeth Olsen, Scarlett Johansson, Chris Evans, Hayley Atwell, Robert Downey Jr., James Spader, Chris Hemsworth, Cobie Smulders, Samuel L. Jackson. 2D. Release: May 22, 2015. DMR.

Zero Gravity *****
With the International Space Station, mankind's ancient dream to leave our planet and conquer space has come true.
La Vingt-Cinquieme Heure, Prospect TV; distributor: Upside Distribution; director: Jurgen Hansen; producers: Jurgen Hansen, Pierre-Emmanuel Le Goff, Natacha Delmon Casanova; script: Jurgen Hansen; DP: Matthias Bolliger. 2D. Captured in 2K. Release: May 2015.
– Have filmed in Houston, Moscow, the Baikonur Cosmodrome in Kazakhstan.

Jurassic World 3D
Universal Pictures; distributor: Universal Pictures; director: Colin Trevorrow. Cast: Chris Pratt, Judy Greer, Bryce Dallas Howard, Vincent D'Onofrio, BD Wong. Release: June 12, 2015. DMR.

Panama Canal 3D: A Land Divided, a World United
Large Screen Cinema; distributor: tba; director: Keith Melton; producer: Gordon Bijelonic; associate producer: Jeffrey Kirsch; DP: Reed Smoot. Narrator: Morgan Freeman. Release: tbd.

Wild Africa 3D (formerly *The Magic of Wild Africa*)
BBC Earth, Reliance Entertainment; distributor: BBC Earth, Giant Screen Films; directors: Patrick Morris, Neil Nightingale; producers: Neil Nightingale, Myles Connolly, Amanda Hill; DPs: Mark Deeble, Robin Cox; executive producers: Deepak Nayar, Stuart Ford, Marcus Arthur, Mike Newell, Mike Devlin, Miles Ketley. ***Release: Summer 2015.***
– In post-production.

America Wild: U.S. National Parks (wt)
MacGillivray Freeman Films; distributor: MacGillivray Freeman Films; directors: Greg MacGillivray, Shaun MacGillivray; producer: Shaun MacGillivray; script: Tim Cahill; DP: Brad Ohlund; score: Steve Wood. ***Release: fall 2015.***
– Filming in summer, fall, and winter 2014

Everest
Universal Pictures; distributor: Universal Pictures; director: Baltasar Kormákur. Cast: Jake Gyllenhaal, Keira Knightley, Robin Wright, Josh Brolin, Sam Worthington, Emily Watson. Release: Sept. 18, 2015. DMR.

Earthflight 3D
John Downer Productions, BBC Earth; distributor: BBC Earth, Giant Screen Films; ***Release: September 2015.***
– In post-production.

Crimson Peak
Legendary Pictures; distributor: Universal Pictures; director: Guillermo del Toro. Cast: Charlie Hunnam, Jessica Chastain, Tom Hiddleston, Mia Wasikowska, Doug Jones, Jim Beaver. 2D. Release: Oct. 16, 2015. DMR.

Star Wars: Episode VII
LucasFilm Ltd; distributor: Walt Disney Pictures; director: J.J. Abrams. Cast: Harrison Ford, Carrie Fisher, Mark Hamill, Andy Serkis, Oscar Isaac, Peter Mayhew, Max von Sydow. Release: Dec. 18, 2015. DMR.

African Safari 3D
nWave Pictures, Studio Canal; distributor: nWave Pictures Distribution; director: Ben Stassen; executive producers: Nadia Khamlichi, Adrian Politowski, Gilles Waterkeyn. Release: tbd.

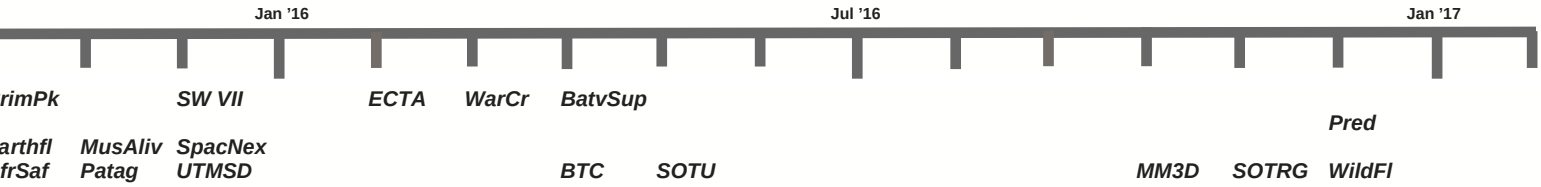
Museum Alive 3D
Atlantic Productions; distributor: tba; director: Daniel M. Smith; producer: Anthony Geffen; script: David Attenborough, Mike Davis; DP: Tim Cragg, Chris Parks; score: Ilan Eshker. Shot in 4K. Cast: David Attenborough. Release: 2015.
– Film was shot in 4K digital for British television. A 40-minute version for 15/70 and digital GS theaters is being prepared.

Patagonia 3D: Into the Wild (wt)
3D Entertainment Films; distributor: 3D Entertainment Distribution; directors/producers: François Mantello, Jean-Jacques Mantello; score: Christophe Jacquelin. Release: 2015.

Space Next 3D *****
A journey of mankind's pursuit to reach the stars.
Afterglow Studios; distributor: TBD; director, producer: Luke Ployhar; script: Scott Pearson. Release: 2015
– NASA archival footage and other archival material will be used along with CGI.

Untitled Toni Myers Space Documentary
Imax Corporation; distributor: Imax Corporation; director/producer: Toni Myers; DP: James Neihouse. Release: 2015.
– September: Digital cameras launched to the International Space Station.
– October: Shooting at ISS began.

Everest: Conquering Thin Air (wt)
MacGillivray Freeman Films; distributor: MacGillivray Freeman Films; director: Greg MacGillivray; producer: Shaun MacGillivray; script: Stephen Judson; DPs: Brad Ohlund, Michael Brown, Greg MacGillivray, Jack Tankard, Ron Goodman; score: Steve Wood. Cast: Jamling Norgay, Araceli Segarra. Release: February 2016.



Warcraft
Universal Pictures; distributor: Universal Pictures; director: Duncan Jones. Cast: Dominic Cooper, Travis Fimmel, Paula Patton, Ben Foster, Toby Kebbell. Release: March 11, 2016. DMR.

***Batman v. Superman: Dawn of Justice* ***
Warner Bros.; distributor: Warner Bros.; director: Zack Snyder. Cast: Ben Affleck, Henry Cavill, Amy Adams, Jason Momoa, Gal Gadot, Jesse Eisenberg, Diane Lane, Jeremy Irons, Holly Hunter, Laurence Fishburne. 2D. Release: March 25, 2016. Filmed in part with IMAX cameras.

Behind the Cube
Radiant Images; distributor: tba; director, writer: Sean Phillips; producers: Brett Ratner, Bobby Mansouri, Michael Mansouri; DP: Vilmos Zsigmond; executive producer: Brett Ratner. Release: Spring 2016.
– Fall: Filmed in Washington state, San Francisco, Japan, London.

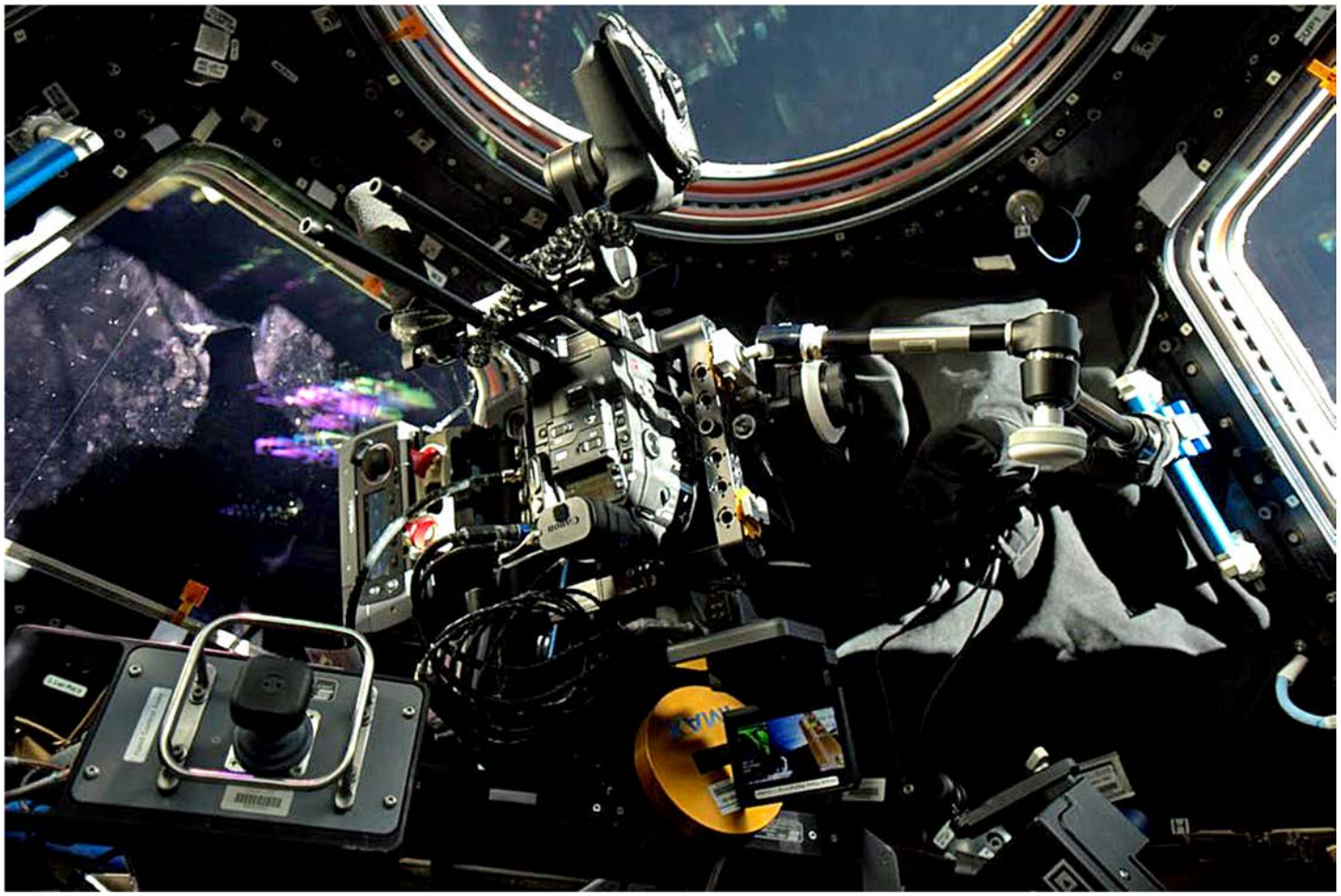
Secrets of the Universe
Stephen Low Company; distributor: K2 Communications; director: Stephen Low; producer: Pietro Serapiglia; DP: Mark Poirier; executive producer: K2 Communications. Release: spring 2016.

Predator
BBC Earth, Silverback Productions; distributor: BBC Earth, Giant Screen Films;director, producer, writer: Alastair Fothergill; DP:Jamie Mcpherson; executive producer: Neil Nightingale. ***Release: December 2016.***

Micro Monsters 3D: A Visit to the World of Insects
Atlantic Productions; distributor: tba; producers: Anthony Geffen, Sias Wilson; writer: David Attenborough; executive producer: Anthony Geffen. Release: 2016.

Secrets of the Royal Garden (formerly *The Kingdom of Plants*)
Atlantic Productions; distributor: tba; director: Martin Williams; producer: Anthony Geffen; script: David Attenborough; DP: Tim Cragg; score: Joel Douek; executive producer: Anthony Geffen. Shot in 4K. Cast: David Attenborough. Release: 2016.

Wild Flight 3D
Atlantic Productions; distributor: tba; director: David Lee; producer: Anthony Geffen; writer: David Attenborough; DPs: Paul Williams, Peter Parks, Chris Parks; executive producer: Anthony Geffen. Release: 2016.



NASA

A Canon C500 4K digital cinema camera mounted in the cupola of the International Space Station for Imax's Untitled Toni Myers Space Documentary. *The camera appears upside down, with a fabric shroud around the window to eliminate reflections. Center bottom is the monitor, showing one of the ISS' solar panels.*

*(from **HOWE** on page 1)*
digital, they will probably do other things in their dome that film can't. Don't want to be left behind.

Then how long *should* we wait? Well, until this new 8K projector comes along; it should be right around the corner, shouldn't it? I'm sure I read that someone had an 8K flat panel about to launch soon, the end of this year? Or was it next year? Anyway, soon. Then there's all those 8K cameras around. My phone's got an 8K camera, and that's the low res front-facing one. 8K's coming, it's probably a year away. Isn't it?

I don't mean to pour cold water on this utopian, just-around-the-corner view of the world, but I suspect it might take a while. Let me explain. Eight-K is complicated. At least four times more complicated than 4K (that's how many more pixels there are). And I say "at least" because, at this resolution, the optical pixels (the bits that actually modulate the light to create the pixels that you see), get really, really small, and the digital pixels (all of the image processing electronics to receive the image data from a server and control the optical pixels so that everything looks as it should), need to work really, really fast.

Chip technologies

The most complicated part of an 8K projector would be "the chip," as it's typically called. This is the device that would contain all of those optical pixels. Approximately 34 million of them. Over the years a few chip technologies have come and gone. The two leading contenders today are liquid crystal on silicon (LCoS) and digital light processor (DLP).

Think of LCoS as a sandwich. Because it is. It spreads a very thin layer of liquid crystals upon a slice of electronic toast containing individual electronic pixels which are covered with a mirror surface. These electronic pixels send a charge through the liquid crystal which changes how the liquid crystal reflects polarized light at that specific point. The top layer of the sandwich is the cover glass and some light polarizers. The polarized light, a lot of it, gets focused on the chip, through the liquid crystal onto the mirror, and back out again. Where that light goes depends upon the digital pixels at the bottom. Good pixels, the one we want on the screen, are aligned by the liquid crystal and sent out through a polarizer and off to the lens; naughty ones don't, and go into the naughty bin, a torrid, dark space designed to absorb light. The better it is at doing that, the better the contrast. Because the pixels are all digital, it's relatively easy (compared to DLP for example) to make them smaller and to make more of them. Which bodes well for 8K. However because all the light has to go through the device, and back out again, it's very sensitive to higher light energy. That's why we don't see very high brightness LCoS projectors. Twenty thousand lumens is about the limit today, which becomes about 16,000 by the time you've got it to the color of white you want and the lamp has been on for a day or so. In contrast, the latest DLP based laser-powered projectors are putting out as much as 70,000 lumens.

So one could imagine an 8K LCoS-based projector (in fact, prototypes exit), but not with the 80,000 lumens or so needed to light up a big dome. Not looking likely anytime soon. Even the slightly cooler laser lumens get pretty hot. Ask **Imax Corporation**, that's their justification for the overlapping-image technique they're using with their DLP-based laser-illuminated projector. Hot things move microscopically, so they're impossible to align. They say.

Digital light processors

DLP's use digital micro-mirror device (DMD) chips, which are almost the complete opposite of LCoS chips. They are an invention of **Texas Instruments** and were first developed into a projector by Rank-Brimar of Great Britain. Their first prototype was demonstrated in 1995. I was there. And like the rest of the audience I almost laughed out loud when they tried to convince us that they were using a chip with mirrors on top. Each mirror, an optical pixel mounted by two corners onto miniature posts with tiny springs, would wiggle really fast to reflect light. The more time it stayed tipped to one side, the more light would be reflected into the lens toward the screen. The more it stayed tipped over to the other side, the more the light of that pixel would go into the DLP version of the naughty bin.

What was most amazing was that each of these pixels was tiny, only 10 micrometers or so across. What happens when the springs break? Won't they fall off? Won't they get stuck? What about the gaps between the pixels, won't we see those on the screen? The questions were obvious and unanimous. As was the skepticism. Except from one group: Texas Instruments. They though it was a great use of their DMD chips. So they eventually developed the projector market by making complete DLP engines to sell to projector manufacturers. And over the years they turned it into the most successful technology for projectors. Yes, in the early days some mirrors fell off (albeit very few). More often some got stuck. But no more.

DLP is probably the most robust technology of this genre; it loves light. Lots of it. Because the light is bounced off the surface, DLP is quite happy being bombarded with tens of thousands of lumens. Just what we need for a giant dome, especially if we're going to fill the entire screen area with it. But it's really difficult to make these moving mirrors much smaller. They're already very small. Can it be done? Only TI knows. But it took them a long time to go from 2k to 4K.

Can they make bigger chips rather than making the mirrors smaller, maybe just for the 8K market, or even just the giant-screen market? Unlikely. TI has always been about volume. Tens of thousands or hundreds of thousands, yes. But not for 200 chips. (Okay, 600; each projector needs three, one each for red, green, and blue).

What about 8K for multiplexes? That's 300,000 chips right there. The problem is, I don't hear any theater chains crying out for 8K right now. Do you?

So we're on our own?

Yes, I think we are for a while. No one, I fear, can make, or is motivated to make, an 8K chip suitable for single-projector giant domes anytime soon. When? I honestly don't know. But to give you a barometer, in 2008 I was doing some work for a very famous theme park company to develop a multi-projector, laser-illuminated

Premiering in December

The Hobbit: The Battle of the Five Armies

"The Hobbit: The Battle of the Five Armies brings to an epic conclusion the adventures of Bilbo Baggins, Thorin Oakenshield, and the Company of Dwarves. The Dwarves of Erebor have reclaimed the vast wealth of their homeland, but now must face the consequences of having unleashed the terrifying Dragon, Smaug, upon the defenseless men, women and children of Lake-town.

"As he succumbs to dragon-sickness, the King Under the Mountain, Thorin Oakenshield, sacrifices friendship and honor in his search for the legendary Arkenstone. Unable to help Thorin see reason, Bilbo is driven to make a desperate and dangerous choice, not knowing that even greater perils lie ahead. An ancient enemy has returned to Middle-earth. Sauron, the Dark Lord, has sent forth legions of Orcs in a stealth attack upon the Lonely Mountain.

"As darkness converges on their escalating conflict, the races of Dwarves, Elves and Men must decide: unite or be destroyed. Bilbo finds himself fighting for his life and the lives of his friends as five great armies go to war.

Directed by **Peter Jackson**, written by **Fran Walsh**, **Philippa Boyens**, Peter Jackson, **Guillermo del Toro**, based on the novel by **J.R.R. Tolkien**. Produced by Peter Jackson, **Carolynne Cunningham**, **Zane Weiner**, and Fran Walsh. The executive producers are **Alan Horn**, **Toby Emmerich**, **Ken Kamins**, and **Carolyn Blackwood**.

Warner Bros.

Martin Freeman in The Hobbit: Battle of the Five Armies.

Starring **Ian McKellen**, **Martin Freeman**, **Richard Armitage**, **Evangeline Lilly**, **Luke Evans**, **Lee Pace**, **Benedict Cumberbatch**, **Billy Connolly**, **Stephen Fry**, **Cate Blanchett**, **Ian Holm**, **Christopher Lee**, **Hugo Weaving**, **and Orlando Bloom**.

dome system. I told them that 2012 will be the "year of the laser." It was "about four years away," I confidently predicted, based on prototypes that were already being shown. So how wrong was I? About 50% wrong. Only now, six years later, are we seeing the very first laser projector shipments.

So 8K chips? I'll stick my neck out and say at least five years. Let's say 2020 to round things up. And if I'm 50% wrong again, then it's 2022 (and a half). Please, if anyone knows any different, and I mean *knows* any different, do tell us, we're anxious to know. Decisions are waiting on it.

Alternatives until then?

The choices are simple: back to where we were in Part 1. Either go with the single-channel approach, that is, a single 4K projector or two double-stacked projectors. Or go multi-channel: an array of projectors blended together. If you're happy with the resolution that 4K single-channel offers, then go with Imax's laser system for a premium solution. The first system for a flat screen will debut this month, and the first production models will be installed in flat screens in the next six to twelve months. The first IMAX dome theater is expected about a year after that, still long before any 8K projector.

Alternatively, contact any of the other vendors offering 4K projectors, servers, and a custom lens set for the dome. It's not trivial, but there are a number of very competent AV companies who could design and integrate a solution. Two such systems have been installed, the largest in a 60-foot (18-meter) dome in Sioux Falls, SD.

If the resolution of 4K isn't good enough (and remember that's 2160 pixels stretching front to back) then you're going multichannel. But fear not. Those early-adopter experiences that I was describing in Part 1 are behind us. Or should be. And don't just take my word for it. The GSCA digital dome demo in Richmond last month (*see LF Examiner, Oct.-Nov. 2014*) demonstrated that multichannel digital can stand confidently alongside film. Point proven.

What hasn't been proved yet is how much effort it takes to maintain that quality. Remember, there is still one significant Achilles' heel in that system. In fact, five: the big, bright, xenon lamps that will change brightness and color as they age. I understand that **Evans & Sutherland** has developed a color management system to solve that problem, but it hasn't been fielded yet. When it is, and assuming it works well enough, then the overall solution should be robust enough that regular maintenance and tweaking becomes a thing of the past. The other good news is that E&S's system isn't based upon profoundly unique technology. Many of the bits and bobs are available in the market. With the right expertise, any number of vendors will be able to emulate this performance.

So that's it? Case closed? No, not quite. There's one last thing to consider...

Part 3 will appear in the January 2015 issue of LF Examiner.

*(from **SHORTS** on page 24)*

Visualization research sought

CADENS (the **Centrality of Advanced Digitally ENabled Science)** is seeking research that "generates, analyzes, or visualizes data and depends upon access to advanced cyberinfrastructure...for inclusion in a series of fulldome digital films and television documentaries," according to a press release. The **Advanced Visualization Laboratory** at the **National Center for Supercomputing Applications** in Urbana-Champaign, IL, has received a $1.2 million grant from the U.S. **National Science Foundation** to produce three ultra-high-res fulldome shows for museum and science center theaters and nine HD projects for television and online distribution.

Potential topics could include (but are not limited to) social science, the environment, astronomy, astrophysics, economic modeling, medicine, and nanoscience, and materials science.

The deadline for applying is Dec. 21, 2014. For more information and to apply, visit go.illinois.edu/cadens.

IMAX on yacht or cruise ship?

News reports have appeared suggesting that IMAX theaters will soon appear on a private super-yacht and a cruise ship. According to *Forbes*, **Yacht Intelligence**, a supplier of custom audio-visual and control systems for super-yachts, has designed an IMAX Private Theater for a 500-foot (150-meter) ship being built for a famous and super-rich (but secret for now) client. The article, by Jim Dobson, states, "The theater will not only show the latest blockbusters, it will also project live underwater CCTV images from outside the yacht onto the walls inside the theatre, giving the concept its name: the Nemo Room."

In an unrelated story, *Cruise Ship News* is reporting an unconfirmed rumor that **Carnival Cruise Lines'** next ship, *Carnival Vista*, may feature an IMAX theater. The ship is expected to start service on April 30, 2016.

Artist's renderings for a planned IMAX Private Theater aboard a 500-foot super-yacht.

Yacht Intelligence (2)

Worldwide GS and IMAX Theaters

As of December 1, 2014

Note: To avoid double counting, theaters with digital and 15/70 systems are shown as 15/70 only.

C = Commercial Standalone CT = Theme Park
CM = Multiplex I = Institutional

By Format and Operator Type

		C	CM	CT	I	Total
Africa	D		4			**4**
	8/70				1	
	10/70				1	**1**
	15/70					
	Total		**4**		**2**	**6**
Asia/Pac	D		207	1	20	**228**
	8/70	1			9	**10**
	10/70				9	**9**
	15/70	2	3	1	28	**34**
	Total	**3**	**210**	**2**	**66**	**281**
Europe	D	2	96	2	3	**103**
	8/70	1		1	6	**8**
	15/70	4	2	5	10	**21**
	Total	**7**	**98**	**8**	**19**	**132**
Middle East	D		8			**8**
	8/70					
	15/70	2			2	**4**
	Total	**2**	**8**		**2**	**12**
North America	D	4	310	1	40	**355**
	8/70	3			11	**14**
	15/70	10	43		70	**123**
	Total	**17**	**353**	**1**	**121**	**492**
South America	D	1	14		1	**16**
	8/70				1	**1**
	15/70	1				**1**
	Total	**2**	**14**		**2**	**18**
World	D	7	639	4	64	**714**
	8/70	5		1	28	**34**
	10/70				10	**10**
	15/70	19	48	6	112	**183**
	Total	**31**	**687**	**11**	**212**	**941**

By 2D / 3D

	2D	3D	Total
Africa	2	4	**6**
Asia/Pac	54	227	**281**
Europe	20	112	**132**
ME	1	11	**12**
NA	72	420	**492**
SA	1	17	**18**
Total	**150**	**791**	**941**

By Screen

	Dome	Flat	Comb	Total
Africa	2	4		**6**
Asia/Pac	47	234		**281**
Europe	14	118		**132**
ME	1	11		**12**
NA	49	443	2	**492**
SA	2	16		**18**
Total	**115**	**824**	**2**	**941**

Bookings: December 2014 by Film

502 bookings of 79 films in 169 theaters

These listings to not include Hollywood films shown in multiplex IMAX theaters. Those films are listed when they are shown in non-multiplex theaters, and conversely, non-Hollywood giant-screen films showing on multiplex IMAX screens are also listed.

Listings shown in **bold face** below are new or updated listings. The rest are unchanged from the previous month's issue.

The data on the following pages are ***not*** warranted to be comprehensive or accurate in every detail, despite our best efforts to make them so. They have been compiled from theater surveys, distributors, the Web, and other sources.

We will make every effort to improve the thoroughness, and accuracy of these data. If your theater or film is not shown here, please get in touch with us to update our listings.

Where a date is not shown, it means that no date was provided by the source or, in the case of a closing date, that no date has been set, or that the run is indefinite.

The key to film abbreviations is on page 21.

Film	Theater	Open	Close
AfricAdv	Katowice CC	10/4/13	10/3/15
	Krakow CC	10/4/13	10/3/15
	Lodz CC	10/4/13	10/3/15
	Poznan CC	10/4/13	10/3/15
	Warsaw CC	10/4/13	10/3/15
AIWC	Chandigarh	9/5/14	9/4/15
Alamo	San Antonio 2D AMC		
Alps	Davenport Put	2/22/14	2/22/15
Amazon	Hartberg	10/1/13	12/31/14
Animalop	Pittsburgh CSC	1/1/10	
Arabia3D	Mexicali	3/28/14	3/27/15
Bugs	Copenhagen	3/1/13	3/31/15
	Dallas PMNS	8/20/13	8/13/15
	Edmonton TWS	12/26/13	12/31/14
	London BFI	9/1/14	9/30/15
	Melbourne MV	9/1/14	9/30/15
	Sydney WBS	8/6/14	8/6/15
	Vancouver TWS	3/11/06	6/30/15
CRA	Hartberg	10/1/13	12/31/14
CV	Alexandria BA	10/1/13	12/31/14
D-Day	Austin TSHM	5/1/14	12/31/14
	Chantilly	5/23/14	12/31/14
	Charlotte DP	8/22/14	12/31/14
	Chicago MSI	5/23/14	12/31/14
	Columbus COSI	**5/23/14**	**12/31/14**
	Columbus GA NIM	5/23/14	12/31/14
	Copenhagen	4/7/14	12/31/14
	Davenport Put	**4/7/14**	**12/31/14**
	Dayton	5/24/14	12/31/14
	Dearborn THF	3/28/14	12/31/14
	Denver MNS	5/24/14	12/31/14
	Edmonton TWS	5/23/14	12/31/14
	Gatineau	4/4/14	12/31/14
	Hampton VASC	5/23/14	12/31/14
	Hastings	10/16/14	12/31/14
	Houston MNS	5/23/14	12/31/14
	Huntsville USSRC	4/11/14	12/31/14
	Hutchinson	4/21/14	12/31/14
	Indianapolis Imx	5/9/14	12/31/14
	Lehi	5/23/14	12/31/14
	Louisville KSC	5/23/14	12/31/14
	McMinnville	5/23/14	12/31/14
	Paris Geo	4/2/14	12/31/15
	Penrith	**9/20/14**	**12/31/14**
	Pensacola NAM	10/1/14	3/31/15
	Portland OMSI	**11/10/14**	**1/18/15**
	Raleigh	5/23/14	12/31/14
	Saint Augustine	5/23/14	12/31/14
	Saint Louis SC	4/25/14	12/31/14
	Seattle PSC 2	3/29/14	12/31/14
	Singapore DC	4/1/14	12/31/14
	Sioux Falls	5/1/14	12/31/14
	Sydney WBS	9/4/14	12/31/14
	Washington NASM	5/23/14	12/31/14
DIA	Hartberg	10/1/13	12/31/14
DinoAliv	**Portland OMSI**	**5/23/14**	**5/30/16**
	Sydney WBS	12/30/13	12/30/14
	Tampa MOSI	2/7/14	2/4/15
DPTP	Baton Rouge LASM	9/12	9/15
	Gatineau	11/1/14	12/14
	Jersey City	10/13	5/15
	Killeen	5/12	5/15
	Louisville KSC	6/14	7/16
	Lubbock SS	1/14	12/14
	Sioux Falls	4/14	12/14
	Tallahassee CLC	9/12	6/15
Dragons	Guayaquil	5/1/14	5/5/15
	Seoul 63	**12/12/14**	**4/30/15**
EarthWin	Auckland Sky	2/14	2/15
	Guayaquil	3/14	2/15
	Vulcania	3/14	2/15
Everest	**Dearborn THF**	**3/1/13**	**12/31/14**
	Hartberg	10/1/13	12/31/14
	Poitiers Imax	5/31/14	1/31/15
FightPil	Chantilly	12/10/04	7/15
	Corpus Christi Lex	5/12/12	7/15
	Dayton	3/1/13	6/30/15
	Huntsville USSRC	7/1/13	7/1/15
	McMinnville	3/23/12	7/1/15
	Pensacola NAM	6/8/11	7/15
	Seattle PSC 2	6/14/13	6/14/15
FlyMons	Des Moines	10/1/14	5/30/15
	Edmonton TWS	12/26/13	12/12/14
	Parker	8/14/14	2/27/15
	Portland OMSI	5/22/14	5/21/15
	Stockholm	5/19/13	12/31/14
FON	Columbus COSI	8/1/14	7/30/15
	Edmonton TWS	12/26/13	12/31/14
	Pittsburgh CSC	6/1/13	12/31/14
	Port of Spain	10/15/14	10/15/15
	San Diego RHF	11/14	12/14
FOTB	Bogota Mal	4/1/13	2/1/15
	Calgary TS	6/18/13	12/31/14
	Chattanooga TA	**10/5/12**	**4/30/15**
	Chicago MSI	**2/28/14**	**2/28/15**
	Cincinnati MC	2/14/13	6/20/15
	Cleveland	**11/27/13**	**6/30/15**
	Columbus COSI	9/1/14	6/30/15
	Davenport Put	**2/15/13**	**6/30/15**
	Dearborn THF	2/18/13	6/12/15
	Des Moines	**7/1/13**	**6/30/15**
	Edmonton TWS	12/26/13	12/31/14
	Fort Lauderdale	2/8/13	2/7/15
	Gatineau	10/5/12	10/4/15
	Greensboro	6/1/13	1/9/15
	Hampton VASC	3/29/13	12/31/14
	Harrisburg	10/18/14	1/31/15
	Hastings	3/17/13	6/12/15
	Houston MNS	10/5/12	6/30/15
	London BFI	**9/6/13**	**1/31/15**
	Melbourne MV	3/21/13	3/20/15
	Memphis Pink	3/1/14	5/22/15
	Mobile	1/14/14	8/31/15
	Orlando SC	3/1/14	2/28/15
	Pittsburgh CSC	3/15/13	12/31/14
	Raleigh	10/19/12	6/30/15
	Regina	1/18/14	1/17/15
	Sacramento Imx	8/13/13	6/30/15
	Saint Augustine	1/18/13	12/31/14
	Saint Paul SMM	10/1/14	6/1/15
	Salt Lake City Clark	2/8/13	8/8/15
	San Diego RHF	10/12/12	6/30/15
	San Jose Tech	2/9/13	6/30/15
	Seattle PSC 2	**10/19/12**	**1/15**
	Sudbury	6/17/13	7/30/15
	Suzhou SCAC	3/31/14	3/31/15
	Tallahassee CLC	1/18/13	12/31/14
	Tampa MOSI	2/8/13	6/30/15
	Vancouver TWS	3/6/13	12/31/14
	Victoria DCI	4/5/13	6/30/15
G3DNW	Apple Valley Imx	10/3/14	4/2/15
	Atlanta FMNH	10/17/14	3/31/15
	Berlin CS	4/20/14	10/19/15
	Budapest CC	4/24/14	4/23/15
	Chattanooga TA	5/23/14	5/31/15
	Copenhagen	2/8/14	2/7/15
	Dallas PMNS	9/1/14	5/31/15
	Davenport Put	10/17/14	10/16/15
	Galveston	5/24/14	12/31/14
	Gatineau	10/10/14	4/9/15
	Guayaquil	4/20/14	4/19/15
	Houston MNS	2/15/14	12/31/14
	Jersey City	7/4/14	1/3/15
	Karlsruhe	10/6/14	8/31/15
	Katowice CC	6/18/14	9/18/15
	Krakow CC	6/18/14	9/18/15
	Kuwait SCK	10/3/14	4/2/15
	Lodz CC	6/18/14	9/18/15
	Los Angeles CSC	10/1/14	2/28/15
	Lubbock SS	11/7/14	6/6/15
	Lucerne	6/5/14	6/4/15
	Montreal SC	2/10/14	2/9/15
	Nuremberg	10/15/14	10/14/15
	Orlando SC	7/5/14	1/14/15
	Phoenix ASC	11/22/14	11/21/15
	Phoenix ASC	12/12/14	7/31/15
	Poznan CC	6/18/14	9/18/15
	Prague CC	5/22/14	5/21/15
	Shanghai Dome STM	12/31/14	12/30/15
	Stockholm	9/30/14	8/31/15
	Tijuana	10/25/14	10/24/15
	Warsaw CC	6/18/14	9/18/15
GC	Grand Canyon DCI	11/1/99	12/14
GCA	Davenport Put	10/3/14	10/2/15
	Gatineau	5/1/13	3/30/15
	Harrisburg	11/1/14	12/31/15
	Paris Geo	7/1/14	6/30/15
	Victoria DCI	**10/3/14**	**1/15/15**
GP	Shanghai Dome STM	8/31/14	8/30/15
Greece	Kolkata SC	1/15/14	1/14/15
GWS	Atlanta FMNH	6/13/14	6/30/15
	Birmingham UK	9/24/13	12/31/14
	Boston NEA	**5/31/13**	**5/31/15**
	Branson	3/1/14	3/1/15
	Columbus COSI	6/1/14	8/1/15
	Des Moines	6/6/14	12/31/15
	Erie	6/6/14	6/30/15
	Galveston	6/28/14	6/30/15
	Houston MNS	8/2/13	7/31/15
	Hutchinson	5/1/14	5/31/15
	Kuwait SCK	**10/15/13**	**4/15/15**
	Lehi	**9/6/13**	**6/30/15**
	Melbourne MV	12/31/13	12/31/14
	New Orleans	**5/24/13**	**5/31/15**
	New York AMNH	7/7/14	1/7/15
	Peoria RM	7/1/14	7/1/15
	Philadelphia FI	7/1/14	7/1/15
	Phoenix ASC	9/1/14	9/1/15
	Pittsburgh CSC	6/13/14	6/30/15
	Portland OMSI	**11/29/13**	**5/31/15**
	Richmond SMV	3/15/14	3/15/15
	Saint Augustine	8/9/13	9/8/15
	Seattle PSC 1	9/19/14	9/19/16
	Singapore SC	**11/1/14**	**10/31/15**
	Sydney WBS	12/30/13	12/30/14
	Tallahassee CLC	6/15/13	1/17/15
	Tijuana	**8/1/14**	**8/31/15**
	Toronto OSC	**10/4/13**	**4/30/15**
	Victoria DCI	1/14/14	1/14/15
	Virginia Beach AMSC	5/29/14	5/31/15
HCBTD	San Simeon DCI	8/17/96	
HidUniv	Aguascalientes	2/28/14	2/27/15
	Chantilly	**1/30/14**	**9/17/15**
	Dayton	5/1/14	4/30/15

Film	Theater	Open	Close
	Glasgow	5/2/14	5/1/15
	Hartford CSC	**12/13/14**	**1/10/15**
	Hong Kong SM	7/1/14	12/31/14
	London SM	**10/18/13**	**11/29/15**
	Lubbock SS	9/12/14	3/11/15
	Melbourne MV	**9/1/13**	**12/31/14**
	Orlando SC	**6/13/14**	**4/2/15**
	Paris Geo	10/3/14	10/2/15
	Puebla	**12/27/13**	**12/26/14**
	Raleigh	11/7/14	11/6/15
	Salt Lake City Clark	7/18/14	7/17/15
	San Diego RHF	7/4/14	7/3/15
	Seattle PSC 2	1/10/14	1/9/15
	Stockholm	9/15/13	12/31/14
	Tallahassee CLC	2/14/14	2/13/15
	Toulouse CDE	2/1/14	1/31/15
	Valencia Spn	4/1/14	3/31/15
	Vancouver TWS	10/11/14	10/10/15
	Washington NASM	**1/30/14**	**9/17/15**
Hobbit3	Raleigh	12/17/14	
HOTB	Beijing 3D CSTM	10/15/14	10/15/15
HumanBod	Stockholm	1/1/12	12/31/14
Interste	Apple Valley Imx	11/4/14	12/14
	Austin TSHM	11/4/14	12/14
	Bradford	11/4/14	12/14
	Branson	11/4/14	12/14
	Chantilly	11/4/14	12/14
	Chicago Imx	11/4/14	12/14
	Dearborn THF	11/4/14	12/14
	Des Moines	11/4/14	12/14
	Fort Lauderdale	11/4/14	12/14
	Huntsville USSRC	11/4/14	12/14
	Indianapolis Imx	11/4/14	12/14
	London BFI	11/4/14	12/14
	London SM	11/4/14	12/14
	Melbourne MV	11/4/14	12/14
	Philadelphia FI	11/4/14	12/14
	Raleigh	11/6/14	
	Sacramento Imx	11/4/14	12/14
	San Jose Tech	11/4/14	12/14
	Seattle PSC 2	11/4/14	12/14
	Sydney WBS	11/4/14	12/14
	Tampa MOSI	11/4/14	12/14
	Washington NASM	11/4/14	12/14
IOLM	Raleigh	4/4/14	
	Salt Lake City Clark	4/4/14	4/3/15
Jerusale	Albuquerque NMMNH	3/2/14	12/31/14
	Birmingham AL	5/23/14	11/23/15
	Branson	3/1/14	6/2/15
	Cincinnati MC	10/10/14	10/9/15
	Dearborn THF	2/8/14	2/7/15
	Denver MNS	2/14/14	2/13/15
	Edmonton TWS	12/26/13	12/31/14
	Fort Worth	9/5/14	2/28/15
	Grand Rapids Cel	10/18/13	12/31/14
	Hague	3/31/14	3/30/15
	Harrisburg	10/18/14	9/30/15
	London BFI	1/1/14	12/31/14
	Lucerne	12/15/14	6/1/15
	Melbourne MV	8/28/14	8/27/15
	Memphis Pink	4/12/14	5/22/15
	Mobile	9/1/14	1/31/15
	Montreal SC	10/10/14	10/9/15
	Pittsburgh CSC	3/7/14	3/6/15
	Raleigh	2/21/14	2/20/15
	Saint Augustine	2/28/14	2/27/15
	Salt Lake City Clark	11/22/13	1/1/15
	Speyer Dome	12/12/13	12/11/14
	Sudbury	4/19/14	4/13/15
	Sydney WBS	2/1/14	1/31/15
	Toronto OSC	3/7/14	12/31/14
	Victoria DCI	8/8/14	7/31/15
JTM	Beijing CFM	1/1/14	12/31/14
JTTSP	Atlanta FMNH	1/24/14	1/13/15
	Boston MOS	1/17/14	1/23/15
	Charlotte DP	6/13/14	6/12/15
	Chattanooga TA	3/7/14	3/6/15
	Cincinnati MC	1/17/14	1/16/15
	Cleveland	5/23/14	5/22/15
	Denver MNS	2/14/14	2/13/15
	Detroit MSC	6/14/14	6/13/15
	Fort Lauderdale	1/17/14	1/16/15
	Fort Worth	**12/26/14**	**12/25/15**
	Galveston	2/14/14	2/13/15
	Hague	7/1/14	6/30/15
	Harrisburg	10/18/14	1/23/15
	Norwalk	7/1/14	10/8/15
	Omaha Zoo	11/2/14	11/1/15
	Paris Geo	5/16/14	5/15/15
	Port of Spain	2/6/14	2/5/15
	Puebla	2/14/14	2/13/15
	Raleigh	12/21/13	12/20/14
	Regina	10/3/14	10/2/15
	Richmond SMV	7/1/14	6/30/15
	Saint Augustine	8/1/13	7/31/15
	San Diego RHF	2/14/14	2/13/15
	San Jose Tech	1/11/14	6/30/15
	Seattle PSC 2	1/24/14	1/23/15
	Shreveport	10/3/14	10/2/15
	Stockholm	2/14/14	2/13/15
	Vancouver TWS	5/17/14	
	Victoria DCI	11/14/14	2/13/15
Kenya	Gatineau	9/27/13	3/31/15
	New Orleans	5/30/14	12/31/14
	Spokane RP	3/1/14	12/31/14
L&C	Columbus COSI	8/1/14	7/30/15
	Davenport Put	2/22/14	2/22/15
	Richmond SMV	9/1/14	8/31/15
	Saint Louis Arch	1/13	2/15
	Washington NMNH	1/1/13	12/31/14
LastReef	**Calgary TS**	**5/26/12**	**2/28/15**
	Chicago Imx	**1/18/13**	
	Davenport Put	**2/3/12**	**6/30/15**
	Houston MNS	**6/29/12**	**6/30/15**
	Hutchinson	**10/5/12**	**9/30/15**
	Indianapolis Imx	**10/4/13**	**6/30/15**
	Louisville KSC	2/8/14	1/9/15
	Lucerne	6/7/13	
	Peoria RM	**2/1/14**	**2/28/15**
	Phoenix ASC	1/18/14	1/18/15
	Sacramento Imx	**1/15/13**	**6/30/15**
	Tallahassee CLC	1/17/14	1/17/15
LBC	Detroit MSC	11/14	2/15
	Galveston	11/14	2/15
	Greensboro	11/14	12/14
	Memphis Pink	11/14	2/15
	Pensacola NAM	11/14	12/14
	Salt Lake City Clark	11/14	2/15
	Sioux Falls	11/14	12/14
LivingSe	Beijing Dome CSTM	1/1/14	1/1/15
	Hartberg	10/1/13	12/31/14
LOF	La Coruna	12/1/13	12/1/14
	Las Palmas	3/15/13	2/28/15
	McMinnville	3/23/12	6/18/15
Meerkats	Edmonton TWS	12/26/13	12/31/14
MOE	**San Diego RHF**	**12/14**	**5/15**
MOF	Pensacola NAM	11/8/96	
MOTGL	Detroit MSC	12/26/12	12/31/14
	Erie	1/1/14	12/31/14
	Grand Rapids Cel	10/1/12	12/31/14
	Lansing Cel	10/1/12	12/31/14
	Portage Cel	10/1/12	12/31/14
MOTM	Boston MOS	10/1/14	6/30/15
MOTN	Alexandria BA	10/1/13	12/31/14
	San Diego RHF	11/14	12/14
	Valencia Spn	1/1/12	12/31/14
MOTUW	Albuquerque NMMNH	1/2/14	1/1/15
	Calgary TS	7/1/14	
	Columbus COSI	11/19/14	11/18/15
	Copenhagen	6/19/14	6/18/15
	Davenport Put	2/1/14	2/1/15
	Erie	3/14/14	3/13/15
	Garden City	9/2/14	9/1/15
	Hartford CSC	9/13/14	9/12/15
	Hastings	6/3/14	6/2/15
	Huntsville USSRC	7/1/14	12/31/14
	Jersey City	7/4/14	7/3/15
	Kuwait SCK	1/27/14	2/1/15
	Lehi	12/20/13	12/19/14
	London SM	8/1/14	7/31/15
	Melbourne MV	3/24/14	3/24/15
	Mexico City Pap	11/15/14	
	Milwaukee	10/1/14	
	Philadelphia FI	7/1/14	6/30/15
	Pittsburgh CSC	1/2/14	1/1/15
	Saint Louis SC	10/9/14	5/30/15
	San Jose Tech	8/30/14	9/1/15
	Sydney WBS	2/14/14	2/15/15
	Valencia Spn	7/1/14	6/30/15
	Washington NMNH	9/26/14	9/25/15
Mummies	**Portland OMSI**	**1/1/14**	**5/30/15**
	San Diego RHF	6/1/14	6/30/15
ND	New Delhi ICC		
Niagara	Niagara Can DCI	7/1/86	
	Niagara NY DCI	5/1/07	
Ozarks	Branson	9/93	12/14
Penguins	Baltimore MSC	6/22/14	6/30/15
	Beijing CFM	1/1/14	1/1/15
	Boston NEA	5/24/13	1/1/15
	Columbus COSI	9/21/13	6/5/15
	Dearborn THF	4/18/14	4/17/15
	Galveston	3/4/14	12/31/14
	Garza Garcia	6/12/14	12/12/14
	Gatineau	12/20/13	12/19/14
	Indianapolis Imx	6/27/14	12/26/14
	Jersey City	6/28/13	1/15/15
	Kagawa	10/1/14	4/12/15
	Lucerne	3/14/14	3/13/15
PolarExp	**Raleigh**	**12/12/14**	**1/15**
PTJH	Albuquerque NMMNH	8/29/14	9/28/15
	Boston MOS	5/1/14	4/30/15
	Cleveland	11/26/14	11/25/15
	Columbus COSI	5/1/14	4/30/15
	Dallas PMNS	5/23/14	5/22/15
	Davenport Put	7/17/14	7/16/15
	Denver MNS	6/1/14	5/31/15
	Edmonton TWS	9/26/14	9/25/15
	Gatineau	5/9/14	5/8/15
	Houston MNS	6/6/14	6/5/15
	Louisville KSC	7/4/14	7/3/15
	Lubbock SS	6/1/14	5/31/15
	Lucerne	9/1/14	9/1/15
	Mexico City Pap	4/1/14	12/31/14
	Milwaukee	6/13/14	6/12/15
	Oklahoma City SMO	8/29/14	2/28/15
	Orlando SC	6/7/14	6/30/15
	Penrith	9/8/14	3/1/15
	Richmond SMV	7/15/14	7/14/15
	Salt Lake City Clark	10/10/14	10/9/15
	Sudbury	10/9/14	8/31/15
	Tampa MOSI	6/28/14	6/27/15
Rescue	Al Khobar	6/6/13	12/14/15
	Beijing CFM	1/14	1/15
	Davenport Put	6/24/12	3/31/15
	Dongguan STM	3/14/14	2/28/15
	McMinnville	6/1/12	5/31/15
Rheged	Penrith	7/1/00	
RME	Pensacola NAM	10/1/14	3/31/15
SAA	Taichung NMNS	7/1/14	6/30/15
SeaMonst	Davenport Put	2/22/14	2/22/15
	Edmonton TWS	12/26/13	12/31/14
	Milwaukee	3/1/14	6/1/15
Sharks3D	Taipei MCRC	1/1/14	12/31/14
SpacJunk	Birmingham UK	1/1/12	1/1/15
	Hastings	9/13/13	
	Hutchinson	10/31/14	10/30/15
	Tallahassee CLC	2/10/12	3/18/15
TA	Birmingham AL	1/6/14	1/6/15
	Chicago Imx	9/12/14	9/12/15
	Harrisburg	**10/8/14**	**10/31/15**
	Hastings	1/15/14	6/30/15
	Louisville KSC	2/8/14	1/10/15
	Memphis Pink	3/8/14	3/8/15
	Portland OMSI	**9/24/14**	**9/30/15**
	Sioux Falls	**4/9/14**	**6/30/15**
TinyGian	**Albuquerque NMMNH**	**12/12/14**	**12/31/15**
	Denver MNS	**12/12/14**	**12/31/15**
	Peoria RM	**9/1/14**	**9/1/15**
	Sioux Falls	9/1/14	9/1/15
	Tallahassee CLC	**12/12/14**	**12/31/15**
ToFly	Mumbai	6/1/14	12/31/14
	Washington NASM	7/1/76	
TOTIA	Al Khobar	6/1/14	6/1/15
	Baltimore MSC	2/1/14	2/1/15
	Birmingham UK	9/24/13	12/31/14
	Chattanooga TA	10/3/14	10/3/15
	Columbus COSI	9/15/14	5/31/15
	Copenhagen	12/12/13	12/12/14
	Davenport Put	2/1/14	2/1/15
	Detroit MSC	9/26/14	9/26/15
	Galveston	**11/15/13**	**6/30/15**
	Hague	**10/1/14**	**10/1/15**

Film	Theater	Open	Close
	Harrisburg	10/18/14	5/31/15
	Hastings	2/1/13	6/30/15
	Houston MNS	1/25/13	6/30/15
	Hutchinson	3/1/13	6/30/15
	Lehi	6/20/14	5/31/15
	Louisville KSC	11/28/13	12/31/14
	Mexicali	**10/15/14**	**6/15/15**
	Nuremberg	**11/19/14**	**11/30/15**
	Orlando SC	10/4/13	8/31/15
	Philadelphia FI	**1/1/14**	**1/31/15**
	Saint Félicien	5/1/14	5/1/15
	Seoul 63	9/1/13	12/31/14
	Spokane RP	5/15/14	5/15/15
	Victoria DCI	8/30/13	5/31/15
	Yellowstone	5/1/14	5/31/15
TTA	Berlin CS	9/6/13	6/30/15

Film	Theater	Open	Close
	Copenhagen	12/12/13	12/12/14
	Jersey City	9/23/14	2/28/15
	Moscow BFC	8/22/14	8/22/15
UWT3D	Gatineau	5/1/14	4/30/15
	Raleigh	2/2/14	4/2/15
	Washington NMNH	3/15/13	3/31/15
VanGogh	Charlotte DP	4/25/14	4/24/15
	Peoria RM	9/18/14	9/17/15
Vulcania	Vulcania	2/22/02	
WATE	Katoomba	6/1/97	
WildOcea	Portland OMSI	1/15/14	1/15/15
WM	Harrisburg I	10/18/14	10/17/15
	Louisville KSC	2/8/14	12/31/14
	Philadelphia FI	4/12/14	1/1/15
	Sioux Falls	3/1/14	1/31/15
WOTA	**Erie**	**10/15/14**	**10/31/15**

Film	Theater	Open	Close
	Gatineau	**12/19/14**	**12/31/15**
	Hangzhou Bro	**11/1/14**	**3/31/15**
	Hutchinson	8/28/14	8/31/15
	Parker	**5/2/14**	**5/31/15**
	Sudbury	3/6/14	3/31/15
WTP	Hutchinson	2/12/14	2/11/15
	Saint Augustine	1/3/14	1/2/15
	Saint Augustine	1/6/14	1/5/15
WWDPP3D	**Columbus COSI**	**9/15/14**	**9/30/15**
	Davenport Put	8/21/14	8/31/15
	Lehi	**9/26/14**	**9/30/15**
	Philadelphia FI	**7/1/14**	**7/3/15**
	Portland OMSI	8/22/14	8/22/15
ZionCany	Zion	7/1/08	

December 2014 by Theater

Theater	Film	Open	Close
Aguascalientes	HidUniv	2/28/14	2/27/15
Al Khobar	Rescue	6/6/13	12/14/15
	TOTIA	6/1/14	6/1/15
Albuquerque NMMNH	Jerusale	3/2/14	12/31/14
	MOTUW	1/2/14	1/1/15
	PTJH	8/29/14	9/28/15
	TinyGian	**12/12/14**	**12/31/15**
Alexandria BA	CV	10/1/13	12/31/14
	MOTN	10/1/13	12/31/14
Apple Valley Imx	G3DNW	10/3/14	4/2/15
	Interste	11/4/14	12/14
Atlanta FMNH	G3DNW	10/17/14	3/31/15
	GWS	6/13/14	6/30/15
	JTTSP	1/24/14	1/13/15
Auckland Sky	EarthWin	2/14	2/15
Austin TSHM	D-Day	5/1/14	12/31/14
	Interste	11/4/14	12/14
Baltimore MSC	Penguins	6/22/14	6/30/15
	TOTIA	2/1/14	2/1/15
Baton Rouge LASM	DPTP	9/12	9/15
Beijing 3D CSTM	HOTB	10/15/14	10/15/15
Beijing CFM	JTM	1/1/14	12/31/14
	Penguins	1/1/14	1/1/15
	Rescue	1/14	1/15
Beijing Dome CSTM	LivingSe	1/1/14	1/1/15
Berlin CS	G3DNW	4/20/14	10/19/15
	TTA	9/6/13	6/30/15
Birmingham AL	Jerusale	5/23/14	11/23/15
	TA	1/6/14	1/6/15
Birmingham UK	GWS	9/24/13	12/31/14
	SpacJunk	1/1/12	1/1/15
	TOTIA	9/24/13	12/31/14
Bogota Mal	FOTB	4/1/13	2/1/15
Boston MOS	JTTSP	1/17/14	1/23/15
	MOTM	10/1/14	6/30/15
	PTJH	5/1/14	4/30/15
Boston NEA	**GWS**	**5/31/13**	**5/31/15**
	Penguins	5/24/13	1/1/15
Bradford	Interste	11/4/14	12/14
Branson	GWS	3/1/14	3/1/15
	Interste	11/4/14	12/14
	Jerusale	3/1/14	6/2/15
	Ozarks	9/93	12/14
Budapest CC	G3DNW	4/24/14	4/23/15
Calgary TS	FOTB	6/18/13	12/31/14
	LastReef	**5/26/12**	**2/28/15**
	MOTUW	7/1/14	
Chandigarh	AIWC	9/5/14	9/4/15
Chantilly	D-Day	5/23/14	12/31/14
	FightPil	12/10/04	7/15
	HidUniv	**1/30/14**	**9/17/15**
	Interste	11/4/14	12/14
Charlotte DP	D-Day	8/22/14	12/31/14
	JTTSP	6/13/14	6/12/15
	VanGogh	4/25/14	4/24/15
Chattanooga TA	**FOTB**	**10/5/12**	**4/30/15**
	G3DNW	5/23/14	5/31/15
	JTTSP	3/7/14	3/6/15
	TOTIA	10/3/14	10/3/15
Chicago Imx	Interste	11/4/14	12/14

Theater	Film	Open	Close
	LastReef	**1/18/13**	
	TA	9/12/14	9/12/15
Chicago MSI	D-Day	5/23/14	12/31/14
	FOTB	**2/28/14**	**2/28/15**
Cincinnati MC	FOTB	2/14/13	6/20/15
	Jerusale	10/10/14	10/9/15
	JTTSP	1/17/14	1/16/15
Cleveland	**FOTB**	**11/27/13**	**6/30/15**
	JTTSP	5/23/14	5/22/15
	PTJH	11/26/14	11/25/15
Columbus COSI	**D-Day**	**5/23/14**	**12/31/14**
	FON	8/1/14	7/30/15
	FOTB	9/1/14	6/30/15
	GWS	6/1/14	8/1/15
	L&C	8/1/14	7/30/15
	MOTUW	11/19/14	11/18/15
	Penguins	9/21/13	6/5/15
	PTJH	5/1/14	4/30/15
	TOTIA	9/15/14	5/31/15
	WWDPP3D	**9/15/14**	**9/30/15**
Columbus GA NIM	D-Day	5/23/14	12/31/14
Copenhagen	Bugs	3/1/13	3/31/15
	D-Day	4/7/14	12/31/14
	G3DNW	2/8/14	2/7/15
	MOTUW	6/19/14	6/18/15
	TOTIA	12/12/13	12/12/14
	TTA	12/12/13	12/12/14
Corpus Christi Lex	FightPil	5/12/12	7/15
Dallas PMNS	Bugs	8/20/13	8/13/15
	G3DNW	9/1/14	5/31/15
	PTJH	5/23/14	5/22/15
Davenport Put	Alps	2/22/14	2/22/15
	D-Day	**4/7/14**	**12/31/14**
	FOTB	**2/15/13**	**6/30/15**
	G3DNW	10/17/14	10/16/15
	GCA	10/3/14	10/2/15
	L&C	2/22/14	2/22/15
	LastReef	**2/3/12**	**6/30/15**
	MOTUW	2/1/14	2/1/15
	PTJH	7/17/14	7/16/15
	Rescue	6/24/12	3/31/15
	SeaMonst	2/22/14	2/22/15
	TOTIA	2/1/14	2/1/15
	WWDPP3D	8/21/14	8/31/15
Dayton	D-Day	5/24/14	12/31/14
	FightPil	3/1/13	6/30/15
	HidUniv	5/1/14	4/30/15
Dearborn THF	D-Day	3/28/14	12/31/14
	Everest	**3/1/13**	**12/31/14**
	FOTB	2/18/13	6/12/15
	Interste	11/4/14	12/14
	Jerusale	2/8/14	2/7/15
	Penguins	4/18/14	4/17/15
Denver MNS	D-Day	5/24/14	12/31/14
	Jerusale	2/14/14	2/13/15
	JTTSP	2/14/14	2/13/15
	PTJH	6/1/14	5/31/15
	TinyGian	**12/12/14**	**12/31/15**
Des Moines	FlyMons	10/1/14	5/30/15
	FOTB	**7/1/13**	**6/30/15**

Theater	Film	Open	Close
	GWS	6/6/14	12/31/15
	Interste	11/4/14	12/14
Detroit MSC	JTTSP	6/14/14	6/13/15
	LBC	11/14	2/15
	MOTGL	12/26/12	12/31/14
	TOTIA	9/26/14	9/26/15
Dongguan STM	Rescue	3/14/14	2/28/15
Edmonton TWS	Bugs	12/26/13	12/31/14
	D-Day	5/23/14	12/31/14
	FlyMons	12/26/13	12/12/14
	FON	12/26/13	12/31/14
	FOTB	12/26/13	12/31/14
	Jerusale	12/26/13	12/31/14
	Meerkats	12/26/13	12/31/14
	PTJH	9/26/14	9/25/15
	SeaMonst	12/26/13	12/31/14
Erie	GWS	6/6/14	6/30/15
	MOTGL	1/1/14	12/31/14
	MOTUW	3/14/14	3/13/15
	WOTA	**10/15/14**	**10/31/15**
Fort Lauderdale	FOTB	2/8/13	2/7/15
	Interste	11/4/14	12/14
	JTTSP	1/17/14	1/16/15
Fort Worth	Jerusale	9/5/14	2/28/15
	JTTSP	**12/26/14**	**12/25/15**
Galveston	G3DNW	5/24/14	12/31/14
	GWS	6/28/14	6/30/15
	JTTSP	2/14/14	2/13/15
	LBC	11/14	2/15
	Penguins	3/4/14	12/31/14
	TOTIA	**11/15/13**	**6/30/15**
Garden City	MOTUW	9/2/14	9/1/15
Garza Garcia	Penguins	6/12/14	12/12/14
Gatineau	D-Day	4/4/14	12/31/14
	DPTP	11/1/14	12/14
	FOTB	10/5/12	10/4/15
	G3DNW	10/10/14	4/9/15
	GCA	5/1/13	3/30/15
	Kenya	9/27/13	3/31/15
	Penguins	12/20/13	12/19/14
	PTJH	5/9/14	5/8/15
	UWT3D	5/1/14	4/30/15
	WOTA	**12/19/14**	**12/31/15**
Glasgow	HidUniv	5/2/14	5/1/15
Grand Canyon DCI	GC	11/1/99	12/14
Grand Rapids Cel	Jerusale	10/18/13	12/31/14
	MOTGL	10/1/12	12/31/14
Greensboro	FOTB	6/1/13	1/9/15
	LBC	11/14	12/14
Guayaquil	Dragons	5/1/14	5/5/15
	EarthWin	3/14	2/15
	G3DNW	4/20/14	4/19/15
Hague	Jerusale	3/31/14	3/30/15
	JTTSP	7/1/14	6/30/15
	TOTIA	**10/1/14**	**10/1/15**
Hampton VASC	D-Day	5/23/14	12/31/14
	FOTB	3/29/13	12/31/14
Hangzhou Bro	**WOTA**	**11/1/14**	**3/31/15**
Harrisburg	FOTB	10/18/14	1/31/15
	GCA	11/1/14	12/31/15

Theater	Film	Open	Close
	Jerusale	10/18/14	9/30/15
	JTTSP	10/18/14	1/23/15
	TA	**10/8/14**	**10/31/15**
	TOTIA	10/18/14	5/31/15
Harrisburg I	WM	10/18/14	10/17/15
Hartberg	Amazon	10/1/13	12/31/14
	CRA	10/1/13	12/31/14
	DIA	10/1/13	12/31/14
	Everest	10/1/13	12/31/14
	LivingSe	10/1/13	12/31/14
Hartford CSC	**HidUniv**	**12/13/14**	**1/10/15**
	MOTUW	9/13/14	9/12/15
Hastings	D-Day	10/16/14	12/31/14
	FOTB	3/17/13	6/12/15
	MOTUW	6/3/14	6/2/15
	SpacJunk	9/13/13	
	TA	1/15/14	6/30/15
	TOTIA	2/1/13	6/30/15
Hong Kong SM	HidUniv	7/1/14	12/31/14
Houston MNS	D-Day	5/23/14	12/31/14
	FOTB	10/5/12	6/30/15
	G3DNW	2/15/14	12/31/14
	GWS	8/2/13	7/31/15
	LastReef	**6/29/12**	**6/30/15**
	PTJH	6/6/14	6/5/15
	TOTIA	1/25/13	6/30/15
Huntsville USSRC	D-Day	4/11/14	12/31/14
	FightPil	7/1/13	7/1/15
	Interste	11/4/14	12/14
	MOTUW	7/1/14	12/31/14
Hutchinson	D-Day	4/21/14	12/31/14
	GWS	5/1/14	5/31/15
	LastReef	**10/5/12**	**9/30/15**
	SpacJunk	10/31/14	10/30/15
	TOTIA	3/1/13	6/30/15
	WOTA	8/28/14	8/31/15
	WTP	2/12/14	2/11/15
Indianapolis Imx	D-Day	5/9/14	12/31/14
	Interste	11/4/14	12/14
	LastReef	**10/4/13**	**6/30/15**
	Penguins	6/27/14	12/26/14
Jersey City	DPTP	10/13	5/15
	G3DNW	7/4/14	1/3/15
	MOTUW	7/4/14	7/3/15
	Penguins	6/28/13	1/15/15
	TTA	9/23/14	2/28/15
Kagawa	Penguins	10/1/14	4/12/15
Karlsruhe	G3DNW	10/6/14	8/31/15
Katoomba	WATE	6/1/97	
Katowice CC	AfricAdv	10/4/13	10/3/15
	G3DNW	6/18/14	9/18/15
Killeen	DPTP	5/12	5/15
Kolkata SC	Greece	1/15/14	1/14/15
Krakow CC	AfricAdv	10/4/13	10/3/15
	G3DNW	6/18/14	9/18/15
Kuwait SCK	G3DNW	10/3/14	4/2/15
	GWS	**10/15/13**	**4/15/15**
	MOTUW	1/27/14	2/1/15
La Coruna	LOF	12/1/13	12/1/14
Lansing Cel	MOTGL	10/1/12	12/31/14
Las Palmas	LOF	3/15/13	2/28/15
Lehi	D-Day	5/23/14	12/31/14
	GWS	**9/6/13**	**6/30/15**
	MOTUW	12/20/13	12/19/14
	TOTIA	6/20/14	5/31/15
	WWDPP3D	**9/26/14**	**9/30/15**
Lodz CC	AfricAdv	10/4/13	10/3/15
	G3DNW	6/18/14	9/18/15
London BFI	Bugs	9/1/14	9/30/15
	FOTB	**9/6/13**	**1/31/15**
	Interste	11/4/14	12/14
	Jerusale	1/1/14	12/31/14
London SM	**HidUniv**	**10/18/13**	**11/29/15**
	Interste	11/4/14	12/14
	MOTUW	8/1/14	7/31/15
Los Angeles CSC	G3DNW	10/1/14	2/28/15
Louisville KSC	D-Day	5/23/14	12/31/14
	DPTP	6/14	7/16
	LastReef	2/8/14	1/9/15
	PTJH	7/4/14	7/3/15
	TA	2/8/14	1/10/15
	TOTIA	11/28/13	12/31/14
	WM	2/8/14	12/31/14
Lubbock SS	DPTP	1/14	12/14
	G3DNW	11/7/14	6/6/15
	HidUniv	9/12/14	3/11/15
	PTJH	6/1/14	5/31/15
Lucerne	G3DNW	6/5/14	6/4/15
	Jerusale	12/15/14	6/1/15
	LastReef	6/7/13	
	Penguins	3/14/14	3/13/15
	PTJH	9/1/14	9/1/15
McMinnville	D-Day	5/23/14	12/31/14
	FightPil	3/23/12	7/1/15
	LOF	3/23/12	6/18/15
	Rescue	6/1/12	5/31/15
Melbourne MV	Bugs	9/1/14	9/30/15
	FOTB	3/21/13	3/20/15
	GWS	12/31/13	12/31/14
	HidUniv	**9/1/13**	**12/31/14**
	Interste	11/4/14	12/14
	Jerusale	8/28/14	8/27/15
	MOTUW	3/24/14	3/24/15
Memphis Pink	FOTB	3/1/14	5/22/15
	Jerusale	4/12/14	5/22/15
	LBC	11/14	2/15
	TA	3/8/14	3/8/15
Mexicali	Arabia3D	3/28/14	3/27/15
	TOTIA	**10/15/14**	**6/15/15**
Mexico City Pap	MOTUW	11/15/14	
	PTJH	4/1/14	12/31/14
Milwaukee	MOTUW	10/1/14	
	PTJH	6/13/14	6/12/15
	SeaMonst	3/1/14	6/1/15
Mobile	FOTB	1/14/14	8/31/15
	Jerusale	9/1/14	1/31/15
Montreal SC	G3DNW	2/10/14	2/9/15
	Jerusale	10/10/14	10/9/15
Moscow BFC	TTA	8/22/14	8/22/15
Mumbai	ToFly	6/1/14	12/31/14
New Delhi ICC	ND		
New Orleans	**GWS**	**5/24/13**	**5/31/15**
	Kenya	5/30/14	12/31/14
New York AMNH	GWS	7/7/14	1/7/15
Niagara Can DCI	Niagara	7/1/86	
Niagara NY DCI	Niagara	5/1/07	
Norwalk	JTTSP	7/1/14	10/8/15
Nuremberg	G3DNW	10/15/14	10/14/15
	TOTIA	**11/19/14**	**11/30/15**
Oklahoma City SMO	PTJH	8/29/14	2/28/15
Omaha Zoo	JTTSP	11/2/14	11/1/15
Orlando SC	FOTB	3/1/14	2/28/15
	G3DNW	7/5/14	1/14/15
	HidUniv	**6/13/14**	**4/2/15**
	PTJH	6/7/14	6/30/15
	TOTIA	10/4/13	8/31/15
Paris Geo	D-Day	4/2/14	12/31/15
	GCA	7/1/14	6/30/15
	HidUniv	10/3/14	10/2/15
	JTTSP	5/16/14	5/15/15
Parker	FlyMons	8/14/14	2/27/15
	WOTA	**5/2/14**	**5/31/15**
Penrith	**D-Day**	**9/20/14**	**12/31/14**
	PTJH	9/8/14	3/1/15
	Rheged	7/1/00	
Pensacola NAM	D-Day	10/1/14	3/31/15
	FightPil	6/8/11	7/15
	LBC	11/14	12/14
	MOF	11/8/96	
	RME	10/1/14	3/31/15
Peoria RM	GWS	7/1/14	7/1/15
	LastReef	**2/1/14**	**2/28/15**
	TinyGian	**9/1/14**	**9/1/15**
	VanGogh	9/18/14	9/17/15
Philadelphia FI	GWS	7/1/14	7/1/15
	Interste	11/4/14	12/14
	MOTUW	7/1/14	6/30/15
	TOTIA	**1/1/14**	**1/31/15**
	WM	4/12/14	1/1/15
	WWDPP3D	**7/1/14**	**7/3/15**
Phoenix ASC	G3DNW	11/22/14	11/21/15
	G3DNW	12/12/14	7/31/15
	GWS	9/1/14	9/1/15
	LastReef	1/18/14	1/18/15
Pittsburgh CSC	Animalop	1/1/10	
	FON	6/1/13	12/31/14
	FOTB	3/15/13	12/31/14
	GWS	6/13/14	6/30/15
	Jerusale	3/7/14	3/6/15
	MOTUW	1/2/14	1/1/15
Poitiers Imax	Everest	5/31/14	1/31/15
Port of Spain	FON	10/15/14	10/15/15
	JTTSP	2/6/14	2/5/15
Portage Cel	MOTGL	10/1/12	12/31/14
Portland OMSI	**D-Day**	**11/10/14**	**1/18/15**
	DinoAliv	**5/23/14**	**5/30/16**
	FlyMons	5/22/14	5/21/15
	GWS	**11/29/13**	**5/31/15**
	Mummies	**1/1/14**	**5/30/15**
	TA	**9/24/14**	**9/30/15**
	WildOcea	1/15/14	1/15/15
	WWDPP3D	8/22/14	8/22/15
Poznan CC	AfricAdv	10/4/13	10/3/15
	G3DNW	6/18/14	9/18/15
Prague CC	G3DNW	5/22/14	5/21/15
Puebla	**HidUniv**	**12/27/13**	**12/26/14**
	JTTSP	2/14/14	2/13/15
Raleigh	D-Day	5/23/14	12/31/14
	FOTB	10/19/12	6/30/15
	HidUniv	11/7/14	11/6/15
	Hobbit3	12/17/14	
	Interste	11/6/14	
	IOLM	4/4/14	
	Jerusale	2/21/14	2/20/15
	JTTSP	12/21/13	12/20/14
	PolarExp	**12/12/14**	**1/15**
	UWT3D	2/2/14	4/2/15
Regina	FOTB	1/18/14	1/17/15
	JTTSP	10/3/14	10/2/15
Richmond SMV	GWS	3/15/14	3/15/15
	JTTSP	7/1/14	6/30/15
	L&C	9/1/14	8/31/15
	PTJH	7/15/14	7/14/15
Sacramento Imx	FOTB	8/13/13	6/30/15
	Interste	11/4/14	12/14
	LastReef	**1/15/13**	**6/30/15**
Saint Augustine	D-Day	5/23/14	12/31/14
	FOTB	1/18/13	12/31/14
	GWS	8/9/13	9/8/15
	Jerusale	2/28/14	2/27/15
	JTTSP	8/1/13	7/31/15
	WTP	1/3/14	1/2/15
	WTP	1/6/14	1/5/15
Saint Félicien	TOTIA	5/1/14	5/1/15
Saint Louis Arch	L&C	1/13	2/15
Saint Louis SC	D-Day	4/25/14	12/31/14
	MOTUW	10/9/14	5/30/15
Saint Paul SMM	FOTB	10/1/14	6/1/15
Salt Lake City Clark	FOTB	2/8/13	8/8/15
	HidUniv	7/18/14	7/17/15
	IOLM	4/4/14	4/3/15
	Jerusale	11/22/13	1/1/15
	LBC	11/14	2/15
	PTJH	10/10/14	10/9/15
San Antonio 2D AMC	Alamo		
San Diego RHF	FON	11/14	12/14
	FOTB	10/12/12	6/30/15
	HidUniv	7/4/14	7/3/15
	JTTSP	2/14/14	2/13/15
	MOE	**12/14**	**5/15**
	MOTN	11/14	12/14
	Mummies	6/1/14	6/30/15
San Jose Tech	FOTB	2/9/13	6/30/15
	Interste	11/4/14	12/14
	JTTSP	1/11/14	6/30/15
	MOTUW	8/30/14	9/1/15
San Simeon DCI	HCBTD	8/17/96	
Seattle PSC 1	GWS	9/19/14	9/19/16
Seattle PSC 2	D-Day	3/29/14	12/31/14
	FightPil	6/14/13	6/14/15
	FOTB	**10/19/12**	**1/15**
	HidUniv	1/10/14	1/9/15
	Interste	11/4/14	12/14
	JTTSP	1/24/14	1/23/15
Seoul 63	**Dragons**	**12/12/14**	**4/30/15**
	TOTIA	9/1/13	12/31/14
Shanghai Dome STM	G3DNW	12/31/14	12/30/15
	GP	8/31/14	8/30/15
Shreveport	JTTSP	10/3/14	10/2/15
Singapore DC	D-Day	4/1/14	12/31/14
Singapore SC	**GWS**	**11/1/14**	**10/31/15**
Sioux Falls	D-Day	5/1/14	12/31/14
	DPTP	4/14	12/14
	LBC	11/14	12/14
	TA	**4/9/14**	**6/30/15**

Theater	Film	Open	Close
	TinyGian	9/1/14	9/1/15
	WM	3/1/14	1/31/15
Speyer Dome	Jerusale	12/12/13	12/11/14
Spokane RP	Kenya	3/1/14	12/31/14
	TOTIA	5/15/14	5/15/15
Stockholm	FlyMons	5/19/13	12/31/14
	G3DNW	9/30/14	8/31/15
	HidUniv	9/15/13	12/31/14
	HumanBod	1/1/12	12/31/14
	JTTSP	2/14/14	2/13/15
Sudbury	FOTB	6/17/13	7/30/15
	Jerusale	4/19/14	4/13/15
	PTJH	10/9/14	8/31/15
	WOTA	3/6/14	3/31/15
Suzhou SCAC	FOTB	3/31/14	3/31/15
Sydney WBS	Bugs	8/6/14	8/6/15
	D-Day	9/4/14	12/31/14
	DinoAliv	12/30/13	12/30/14
	GWS	12/30/13	12/30/14
	Interste	11/4/14	12/14
	Jerusale	2/1/14	1/31/15
	MOTUW	2/14/14	2/15/15

Theater	Film	Open	Close
Taichung NMNS	SAA	7/1/14	6/30/15
Taipei MCRC	Sharks3D	1/1/14	12/31/14
Tallahassee CLC	DPTP	9/12	6/15
	FOTB	1/18/13	12/31/14
	GWS	6/15/13	1/17/15
	HidUniv	2/14/14	2/13/15
	LastReef	1/17/14	1/17/15
	SpacJunk	2/10/12	3/18/15
	TinyGian	**12/12/14**	**12/31/15**
Tampa MOSI	DinoAliv	2/7/14	2/4/15
	FOTB	2/8/13	6/30/15
	Interste	11/4/14	12/14
	PTJH	6/28/14	6/27/15
Tijuana	G3DNW	10/25/14	10/24/15
	GWS	**8/1/14**	**8/31/15**
Toronto OSC	**GWS**	**10/4/13**	**4/30/15**
	Jerusale	3/7/14	12/31/14
Toulouse CDE	HidUniv	2/1/14	1/31/15
Valencia Spn	HidUniv	4/1/14	3/31/15
	MOTN	1/1/12	12/31/14
	MOTUW	7/1/14	6/30/15
Vancouver TWS	Bugs	3/11/06	6/30/15

Theater	Film	Open	Close
	FOTB	3/6/13	12/31/14
	HidUniv	10/11/14	10/10/15
	JTTSP	5/17/14	
Victoria DCI	FOTB	4/5/13	6/30/15
	GCA	**10/3/14**	**1/15/15**
	GWS	1/14/14	1/14/15
	Jerusale	8/8/14	7/31/15
	JTTSP	11/14/14	2/13/15
	TOTIA	8/30/13	5/31/15
Virginia Beach AMSC	GWS	5/29/14	5/31/15
Vulcania	EarthWin	3/14	2/15
	Vulcania	2/22/02	
Warsaw CC	AfricAdv	10/4/13	10/3/15
	G3DNW	6/18/14	9/18/15
Washington NASM	D-Day	5/23/14	12/31/14
	HidUniv	**1/30/14**	**9/17/15**
	Interste	11/4/14	12/14
	ToFly	7/1/76	
Washington NMNH	L&C	1/1/13	12/31/14
	MOTUW	9/26/14	9/25/15
	UWT3D	3/15/13	3/31/15
Yellowstone	TOTIA	5/1/14	5/31/15

Key to Film Abbreviations

Film	Title	Year		Dist
AfricAdv	African Adventure 3D	2007	3D	nWP
AIWC	Adventures in Wild California	2000		MFF
Alamo	Alamo: The Price of Freedom	1988		MFF
Alps	Alps: Giants of Nature, The	2007		NGD
Amazon	Amazon	1997		MFF
Animalop	Animalopolis	2008	3D	K2
Arabia3D	Arabia 3D	2010	3D	MFF
Bugs	Bugs!	2003	3D	SKF
CRA	Coral Reef Adventure	2003		MFF
CV	Cosmic Voyage	1996		IMAX
D-Day	D-Day: Normandy 1944	2014	3D	3DED
DIA	Dream is Alive, The	1985		IMAX
DinoAliv	Dinosaurs Alive	2007	3D	GSF
DPTP	Dinosaur Passage to Pangaea	2011	3D	CGI
Dragons	Dragons: Real Myths and Unreal Creatures	2013	3D	B&D
EarthWin	Earth Wins, The	2013		HFL
Everest	Everest	1998		MFF
FightPil	Fighter Pilot: Operation Red Flag	2004	3D	K2
FlyMons	Flying Monsters 3D	2011	3D	NGD
FON	Forces of Nature	2004		NGD
FOTB	Flight of the Butterflies	2012	3D	SKF
G3DNW	Galapagos 3D: Nature's Wonderland	2014	3D	nWP
GC	Grand Canyon: The Hidden Secrets	1985		NGD
GCA	Grand Canyon Adventure: River at Risk 3D	2008	3D	MFF
GP	Greatest Places, The	1998		MFF
Greece	Greece: Secrets of the Past	2006		MFF
GWS	Great White Shark	2013	3D	GSF
HCBTD	Hearst Castle: Building the Dream	1996		NGD
HidUniv	Hidden Universe	2013	3D	MFF
Hobbit3	Hobbit: The Battle of the Five Armies	2014	3D	WB
HOTB	Hurricane on the Bayou	2006		MFF
HumanBod	Human Body, The	2001		NGD
Interste	Interstellar	2014		PPC
IOLM	Island of Lemurs: Madagascar	2014	3D	IMAX
Jerusale	Jerusalem	2013	3D	NGD
JTM	Journey to Mecca	2009		SKF
JTTSP	Journey to the South Pacific	2013	3D	MFF
Kenya	Kenya 3D: Animal Kingdom	2013	3D	3DED
L&C	Lewis & Clark: Great Journey West	2002		NGD
LastReef	Last Reef, The	2012	3D	GSF
LBC	Light Before Christmas, The	2008		CGI
LivingSe	Living Sea, The	1994		MFF
LOF	Legends of Flight	2010	3D	K2
Meerkats	Meerkats 3D	2012	3D	NGD
MOE	Mysteries of Egypt	1998		NGD
MOF	Magic of Flight, The	1997		MFF
MOTGL	Mysteries of the Great Lakes	2008		SN
MOTM	Mystery of the Maya	1995		BFI
MOTN	Mystery of the Nile	2005		MFF
MOTUW	Mysteries of the Unseen World	2013	3D	NGD
Mummies	Mummies: Secrets of the Pharaohs	2007		GSF
ND	Neelkanth Darshan	2005		unk

Film	Title	Year		Dist
Niagara	Niagara: Miracles, Myths, and Magic	1987		NGD
Ozarks	Ozarks: Legacy and Legend	1993		IMAX
Penguins	Penguins 3D	2013	3D	nWP
PolarExp	Polar Express: An IMAX 3D Experience, The	2004	3D	WB
PTJH	Pandas: The Journey Home	2014	3D	NGD
Rescue	Rescue 3D	2011	3D	K2
Rheged	Rheged: The Lost Kingdom	2000		unk
RME	Rocky Mountain Express	2011		SLC
SAA	Shackleton's Antarctic Adventure	2001		NGD
SeaMonst	Sea Monsters: A Prehistoric Adventure	2007		NGD
Sharks3D	Sharks 3D	2004	3D	3DED
SpacJunk	Space Junk	2012	3D	K2
TA	Tornado Alley	2011	3D	GSF
TinyGian	Tiny Giants 3D	2014	3D	GSF
ToFly	To Fly!	1976		MFF
TOTIA	Titans of the Ice Age	2013	3D	GSF
TTA	To the Arctic	2012	3D	IMAX
UWT3D	Ultimate Wave Tahiti 3D, The	2010	3D	K2
VanGogh	Van Gogh: Brush with Genius	2009		MFF
Vulcania	Vulcania	2002		unk
WATE	Wild Australia: The Edge	1997		MSI
WildOcea	Wild Ocean	2008	3D	GSF
WM	Watermelon Magic	2013	3D	B&D
WOTA	Wonders of the Arctic	2014	3D	GSF
WTP	We the People	2013		ISP
WWDPP3D	Walking With Dinosaurs: Prehistoric Planet 3D	2014	3D	GSF
ZionCany	Zion Canyon	1994		K2

December 2014 Bookings Count

#	Film	#	Film	#	Film	#	Film
39	FOTB	5	FlyMons	2	Dragons	1	Hobbit3
34	D-Day	5	FON	2	IOLM	1	HOTB
32	G3DNW	5	GCA	2	LivingSe	1	HumanBod
30	GWS	5	L&C	2	Mummies	1	JTM
29	JTTSP	5	MOTGL	2	Niagara	1	Meerkats
26	Jerusale	5	Rescue	2	ToFly	1	MOE
25	TOTIA	5	TinyGian	2	VanGogh	1	MOF
24	MOTUW	5	WWDPP3D	1	AIWC	1	MOTM
22	HidUniv	4	SpacJunk	1	Alamo	1	ND
22	Interste	4	TTA	1	Alps	1	Ozarks
22	PTJH	4	WM	1	Amazon	1	PolarExp
12	LastReef	3	DinoAliv	1	Animalop	1	Rheged
12	Penguins	3	EarthWin	1	Arabia3D	1	RME
8	DPTP	3	Everest	1	CRA	1	SAA
8	TA	3	Kenya	1	CV	1	Sharks3D
7	Bugs	3	LOF	1	DIA	1	Vulcania
7	FightPil	3	MOTN	1	GC	1	WATE
7	LBC	3	SeaMonst	1	GP	1	WildOcea
6	WOTA	3	UWT3D	1	Greece	1	ZionCany
5	AfricAdv	3	WTP	1	HCBTD		

Directory of Organizations Mentioned in this Issue of LF Examiner

Distributors' abbreviations are listed in **bold.**

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527 Marquette Ave. #2500
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Atlantic Productions
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BBC Earth
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BIG & Digital **B&D**
2900 Sunridge Heights Pkwy., #1218
Henderson, NV 89052 USA
Tel: 502-212-1559
http://biganddigital.com/

Big Films, Inc. **BFI**
1066 Boucher Crescent
Manotick, ON K4M 1B3 CANADA
Tel: 613-692-9856
Fax: 613-692-9857
www.bigfilms.ca

BioPixel
Marine & Tropical Biology
14-88 McGregor Road
Smithfield, QLD 4878 AUSTRALIA
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www.biopixel.tv

Blaze Digital Cinema Works
1771 Post Road East, #164
Westport, CT 06880 USA
Tel: 203-292-5745
Fax: 203-404-4998
http://blazedigitalcinema.com/

Blue Ocean Film Festival
200 2nd Ave. South #467
Saint Petersburg, FL 33701 USA
Tel: 727-388-6682
www.blueoceanfilmfestival.org

China Film Group
25 Xin Wai Street
Beijing, 100088 CHINA
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Christie Digital Systems USA, Inc.
10550 Camden Drive
Cypress, CA 90630 USA
Tel: 714-236-8610
Fax: 714-229-7128
www.christiedigital.com

Cinema Group, Inc. **CGI**
464 S. Ranch Drive
Alpine, UT 84004 USA
Tel: 801-772-0860

Columbia Pictures **COL**
10202 W. Washington Blvd.
Culver City, CA 90232 USA
www.sonypictures.com/

Cosmic Picture
6000 3E Avenue
Montreal, QC H1Y 2X3 CANADA
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D3D Cinema
990 Grove St., Suite 200
Evanston, IL 60201 USA
Tel: 847-475-9140
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www.d3dcinema.com/

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www.decembermedia.com.au

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SHORTS

Interstellar opens big in IMAX

Christopher Nolan's ***Interstellar*** opened in 574 IMAX theaters worldwide in early November, grossing $20.5 million in its first weekend, $13.2 million from 368 domestic theaters, and $7.3 million from 206 international theaters. This is not a record: at least seven previous DMR films have opened with higher grosses, the record being held by ***Star Trek Into Darkness*** in May 2013, with $43.6 million globally.

In North America, 19 of *Interstellar*'s 20 highest-grossing venues were IMAX theaters, and roughly one quarter of the domestic box office was generated by IMAX screens a record for "a first-run IMAX release," according to a press release. Internationally, it had the highest-grossing 2D IMAX opening weekend and set the same record in China, where it opened a week later, and earned $6.7 million in 174 theaters.

Interstellar includes more than an hour of footage shot with IMAX 15/65 cameras, and opened two days in advance of the general opening in 56 IMAX film-based theaters worldwide.

IMAX Melbourne's QTRUs filled with five Christopher Nolan films.

Richard Morrison

GSCA election results

The **Giant Screen Cinema Association** has announced the results of its recent election. The following people will join the board for a two-year term, beginning on Jan. 1, 2015.

Jonathan Barker, SK Films
Kim Cavendish, Museum of Discovery and Science
Daniel Ferguson, Cosmic Picture
Mark Katz, National Geographic Studios
Mike Lutz, Imax Corporation
Alan Nursall, Telus World of Science Edmonton
Berend Reijnhoudt, Omniversum
Glenn Shaver, Ontario Science Centre
Gordon Stalans, Tennessee Aquarium
Phil Streather, Principal Large Format

They join 11 other board members who have one year left in their terms. Officers and committee chairs will be announced in late December.

GSCA Film Expo registration open

Registration and film submissions are now being accepted for the **Giant Screen Cinema Association**'s Film Expo and Filmmaker Symposium, to be held March 9–12 in Los Angeles, CA. The Film Expo will feature screenings of new films, and presentations on films in production and development. The Filmmaker Symposium will feature "hands-on opportunities for those involved in production and postproduction to learn more about the technology, techniques, and business practices that are unique to the giant-screen format."

Discounted registration rates are available through Jan. 30. The deadline for film submissions is Jan. 16.

For more information, visit giantscreencinema.com.

Melbourne's Nolan festival

In anticipation of ***Interstellar***, Australia's **IMAX Theatre Melbourne** ran 15/70 screenings of director **Christopher Nolan**'s four previous films: 2010's ***Inception***, and the *Batman* trilogy: ***Batman Begins*** (2005), ***The Dark Knight*** (2008), and ***The Dark Knight Rises*** (2012). All but *Batman Begins* were filmed in part with IMAX 15/65 cameras. General manager **Richard Morrison** tells *LF Examiner* that the "Nolanathon" represented the most DMR titles the theater has run at the same time, and helped make the theater the highest-grossing opening week for *Interstellar* in Australia.

Nolan recognized the achievement by recording a personal video greeting for the theater that was run before the screenings.

Batman v. Superman shot in IMAX

Imax Corporation has confirmed that director **Zack Snyder** is shooting parts of ***Batman v. Superman: Dawn of Justice*** with IMAX cameras after a photographer tweeted that he saw one being used on a Chicago location. The scene being shot was reportedly the iconic murder of Bruce Wayne's parents.

Snyder has directed five films that were converted to IMAX with the DMR process, but *Batman v. Superman* is his first to be shot with IMAX cameras. Produced and distributed by **Warner Bros. Pictures**, it stars **Ben Affleck** and **Henry Cavill** in the title roles, **Jason Momoa** as Aquaman, **Gal Gadot** as Wonder Woman, **Jesse Eisenberg** as Lex Luthor, and **Jeremy Irons** as Alfred. **Amy Adams**, **Diane Lane**, and **Laurence Fishburne** reprise their roles from Snyder's 2013 ***Man of Steel*** as Lois Lane, Martha Kent, and Perry White, respectively. *Batman v. Superman* will be released on March 25, 2016.

Blue Ocean Festival winners

Three giant-screen projects were recognized at the **Blue Ocean Film Festival** held in St. Petersburg, FL, Nov. 7. **Giant Screen Films**' ***Great White Shark*** won the Blue Carpet Award for Marine Life as well a Special Jury Recognition for 3D. Another GSF release, ***Antarctica 3D: On the Edge***, won for Exploration and Adventure, and **MacGillivray Freeman Films**' ***Journey to the South Pacific*** won in the Documentary Feature Film category.

*(see **SHORTS** on page 16)*